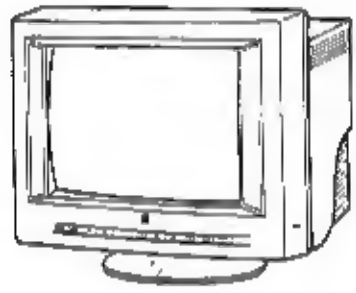
Service Manual

Multi-Scan Color CRT Display
MODEL NO. 1769GA-1

ViewSonic 17GA



CONTENTS

ViewSonic

5.4 Acceptable timing

- If your timing is within the following specification, this CRT display can automatically function with a certain size and position.

Horizontal:	Sync frequency:	30.0 ~ 69.0 kHz
	Blanking Time:	≥ 3.0 µs
	Back Porch:	≥ 1.25 µs
	Front Porch:	≤ Back Porch
	Sync Width:	≥ 1.2 µs
Vertical:	Sync frequency:	50.0 ~ 160.0 Hz
	Blanking Time:	≥ 0.5 ms
	Back Porch	≥ 0.4 ms
	Sync Width:	≥ 0.045 ms

- Several items like size, position and distortion can be adjusted through the OSD menu, and if you want to keep it, please push the ⊡ key for memory, or keep the key untouched for about 20 seconds and it is automatically memorized.

NOTE: In case of RECALL, if the key is untouched for about 30 seconds, RECALL function will be canceled.

Please note, however, that there are cases where you can not get the size and/or position you want. (For instance, Display video Time is too short, you can't get bigger size of the image.)

- The CRT adopted in this CRT display is designed to minimize the moire phenomenon at a suitable size for typical display modes. However, there might be a display format among many formats, in which the moire phenomenon appears on this display.

5.5 Signal level and input impedance

5.5.1 Video Signal level

- This CRT display is adjusted at the factory using 0.7V p-p Video Signal, Black level is 0V.
- This CRT display is compatible with 1.0V p-p Video Signal by using the Video input level selection.

5.5.2 Sync Signal level

- H/V Separate, H/V Mixed : TTL level
- Sync on Green: 0.3 V p-p ± 0.015 V

5.5.3 Input impedance

- Video input: 75 Ω
- Sync input: ≥ 1 kΩ

5.6 Display performance

5.6.1 Display area

1) PRESET TIMING

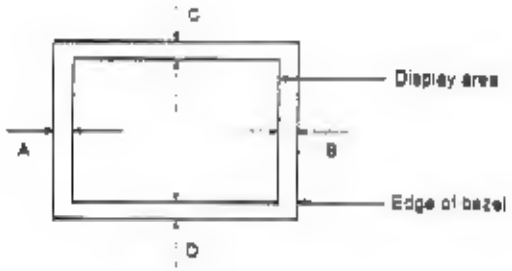
	(MODE 1 & 2)	(MODE 3)
WIDTH	300 mm ± 5 mm	286 mm ± 5 mm
HEIGHT	225 mm ± 5 mm	229 mm ± 5 mm

5.6.2 Centering

1) PRESET TIMING (MODE 1~3)

IA – BI ≤ 4 mm

IC – DI ≤ 4 mm



5.6.3 Distortion

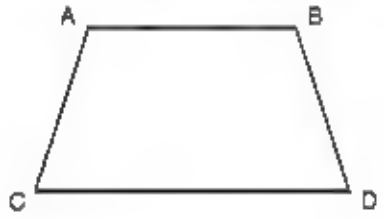
1) Trapezoid

IAC– BDI ≤ 2.0 mm (one side)

≤ 3.0 mm (total)

IAC– BDI ≤ 2.0 mm

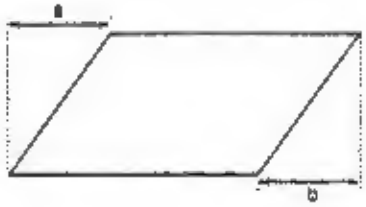
≤ 1.0 mm (after adjustment)



2) Parallelogram

a, b ≦ 2.0 mm

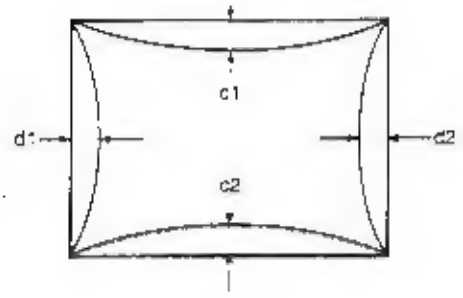
≦ 1.0 mm (after adjustment)



3) Pincushion and Barrel

|C1 - C2| ≤ 2.0 mm

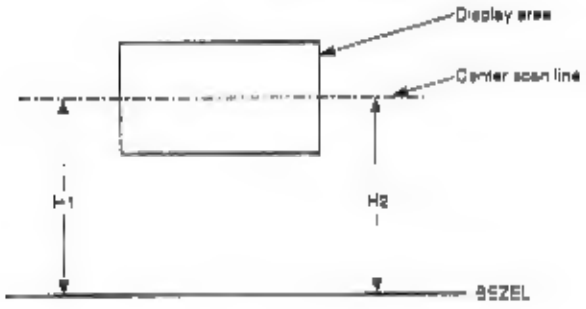
|d1 - d2| ≤ 2.0 mm



5.6.4 Rotation

|H1 - H2| ≤ 2.0 mm (0.079")

≤0 mm (after user adjustment)



5.6.5 Linearity

Horizontal linearity

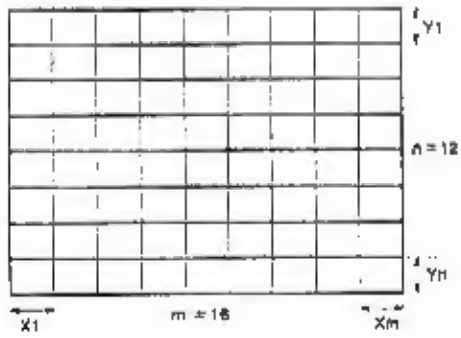
$$\frac{X\,max. - X\,min.}{X\,max. + X\,min.} \times 100\ \% \leq 6\ \%(48 \sim 64\ kHz)$$

≤ 7 %(except above frequency range)

Vertical linearity

$$\frac{Y\,max. - Y\,min.}{Y\,max. + Y\,min.} \times 100\ \% \leq 5\ \%(50 \sim 75\ Hz)$$

≤ 6 %(except above frequency range)



<Conditions>

Display image ------- crosshatch pattern

Maximum and minimum values should not be adjacent to each other.

X max. is maximum value among X1~Xm

X min. is minimum value among X1~Xm

Y max. is maximum value among Y1~Yn

Bandwidth	86 MHz (Typ.)

5.7.2 Maximum luminance

Value	120 cd/m² (Typ.) for 5% white field at the center of the display area. 110 cd/m² (Typ.) for 100% white field at the center of the display area. Specified by 9300 K + 27 MPCD
Conditions	Display image : White full flat field Luminance : Max. (Contrast : Max.) (Brightness : Detent point)

5.7.3 Minimum luminance

Value	≤ 26 cd/m² at the center of the display area. Specified by 9300 K + 27 MPCD
Conditions	Display image : White full flat field Luminance : Min. (Contrast : Min.) (Brightness : Detent point)

5.7.4 Brightness variation

Value	70 % (Min.) Variation = C/A X 100
Conditions	Display image : White full flat field Luminance : MAX (Contrast : MAX) (Brightness : Detent point) A : Luminance at center position C : Luminance at position of lowest brightness

5.7.5 Display area regulation

	Display area variation	Range of variation
Due to Luminance	within 3 mm	26~110 cd/m² (white flat field)
Due to Power Supply	within 3 mm	AC : 90-132 V or 180-264 V
Due to Temperature	within 4 mm	0 - 40° C (fh=30-65 kHz)

5.7.6 Color Point

< Conditions >

Display image : White flat field at the center of the display area.

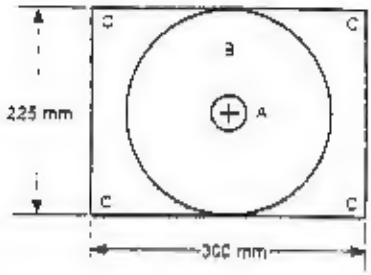
Luminance : Brightness Detent point.

Contrast	max	min
Value	9300 K + 27 MPCD x = 0.281 ± 0.020 y = 0.311 ± 0.020	9300 K + 27 MPCD x = 0.281 ± 0.020 y = 0.311 ± 0.020

5.7.7 Misconvergence

Center area of display (A) : 0.3 mm (Max.)

Corner area of display (B) : 0.4 mm (Max.)



<Conditions>

Display image : Crosshatch pattern mixed with R, G and B colors.

Convergence gauge : KLEIN CM7AG or equivalent.

Display area : W x H 300 x 225 mm

5.7.8 Purity

Conspicuous mislanding shall not be visible within display area at a distance of 60cm from CRT surface.

<Conditions>

Display image : White flat field

Luminance : Contrast max, Brightness Detent point

5.7.9 Jitter

Invisible at a distance of 60 cm from CRT surface.

6. ENVIRONMENTS

6.1 Ambient temperature, humidity and altitude

	Operating	Storage and shipment
Temperature	0 ~ 40° C *1	-20 ~ +60° C (-4 ~ 140° F)
Humidity	5 ~ 90 % *2	5 ~ 90 % *2
Altitude	3,000 m (Max.) (10,000 ft)	12,000 m (Max.) (40,000 ft)

*1 0 ~ 35° C for 66 ~ 69 kHz

*2 Non-condensation

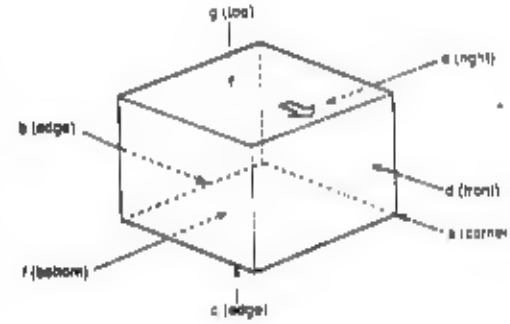
6.2 Vibration and shock

6.2.1 Vibration

	Order of tests	Direction of vibration		Acceleration: Non-operation	Acceleration: Storage and shipment	Frequency	Sweep	Test time
Unpacked	1	Vertical	Up to down	2.9 m/s² (0.3 G)		5 - 55 Hz	120 s	30 min
	2	Horizontal	Front to back					15 min
	3		Right to left					
Packed	1	Vertical	Up to down		12.3m/s² (1.25 G)	5 - 50 Hz	810 s Logsweep	40 min.
	2	Horizontal	Front to back		7.4 m/s² (0.75 G)			20 min
	3		Right to left					

6.2.2 Shock (Drop test)

Unpacked	20 G One time for each face (6 faces) (non-operation)			
Packed	Order of drop	Face to drop is to face the floor. (See the figure)	Height	Number of drop
	1	a, b, c, d, e, g	60 cm	1 time for each
	2	f	70 cm	



7. REGULATORY STANDARDS

7.1 Safety standards

Applicable standards

UL 1950, Listing

CSA 22.2 No. 950, Products Certification

TÜV (IEC-950)/GS (ZH1)

DHHS, 21 CFR subchapter J, X-Ray Radiation

PTB, X-Ray Radiation, Approval

HWC

NORD.C

Energy Star

7.2 EMC standards

Designed to meet following standards

VCC I class II

FCC: FCC part 15, subpart B, class-B

VDE 0878/06.83

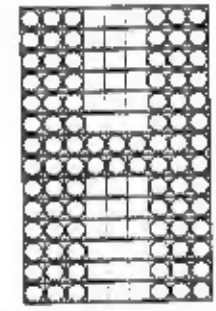
Vfg 243/1991

CISPR22 class B

MPR-II Radiation

<EMI test pattern>

White, full "H" characters (9 x 14 dots), block (12 x 24 dots) "H" character font is as follows



8. POWER CORD

•Northern Hemisphere Version
(North America and Japan)
··· CSA approved power cord (Wall Type)

•European Version
··· VDE approved power cord (PC Type)

•Australia, New Zealand Version
··· None

9. SIGNAL CABLE

Signal cable with Mini D-Sub 15P connectors at both end is put in package.

Length : 1.5 meter (4.93 feet)

10. RELIABILITY

> 55,000 hrs (demonstrated MTBF)

10. COLOR CRT DEFECTIVE STANDARD

10.1 Specification of screen blemishes

This instruction is applied to inspection of the screen faults and the glass quality of the faceplate.

10.2 Test procedure

10.2.1 Tests are to be done under the following two conditions:

(a) With a blanked white raster at 80 μA.

(b) With incident light (white light of 700 - 1000 lux at the center of the screen: the tube does not operate).

10.2.2 Viewing distance should be 60 cm minimum. Faults not visible at this viewing distance are permitted.

10.2.3 The following quality areas are specified:

Zone A: Rectangular area (sides X and Y) in which the point of intersection of the diagonals coincides with the mechanical center of the screen.

	Screen size	
	X	Y
Zone A	320mm (12.6")	240mm (9.45")

Zone B: The remaining screen area except zone A. Specified zone is applied to glass faceplate defects.

10.2.4 Remarks concerning faults

a) Unless otherwise specified, the size of a fault is the smallest value found with one of the two formulas.

$$\frac{a+b}{a} \cdot \frac{a}{20} + 2b \quad (a = \text{length}\ \ b = \text{width})$$

b) For entirely or partially missing and/or non-fluorescent phosphor dots hold the following definitions:

Entire defect: Remaining part is not more than 50% of the complete dot.

Partial defect: Remaining part is between 50% and 75% of the complete dot.

10.3 Permissible limit

10.3.1 Screen faults

Missing phosphor dots, black spots, filled mask holes and copper stains

Size of defects				Max. permissible number	Min. permissible distance between defects	Max. permissible number in circle of ϕ 50 mm
Entire defects	A	A1	3 adjacent trios or more	0	—	—
		A2	3 adjacent same color dots or more	0		
		A3	More than 6 adkacent dots	0		
	B	B1	2 adjacent trio	0	—	—
		B2	4 or 5 adjacent dots	0		
		B3	2 adjacent same color dots	1		
	C	C1	1 trio	1	20 mm	—
		C2	2 adjacent different color dots	2		
		C3	1 dot	7		
	B + C			—	20 mm	—
Partial defects	D		3 adjacent same color dots or more	—	—	5
Total pieces of defects excluding partial defects				7	—	—

— Entire defects having separation less than min. permissible distance are defined as an adjacent defects.

— Defects of remaining part more than 75% is ignored, except for concentration having diameter more than ϕ 8 mm

*0.3.2 Glass faceplate defects

(A) Air bubbles, open bubbles, stones and elongated air bubbles.

Area			Zone A	Zone B
Permissible major defects	Air Bubble. (average dia.)		0.51 – 0.70 mm	0.51 – 0.70 mm
	Spot and open air bubble (average dia.)		0.51 – 0.70 mm	0.51 – 0.70 mm
	Maximum Permissible number	Each zone	1	1
		Total	2	
	Minimum allowable distance among defects		57 mm	
Permissible defects within any 50 m-dia.-circle	Air Bubble. (average dia.)		0.25 – 0.50 mm	
	Spot and open air bubble (average dia.)		0.20 – 0.40 mm	
	Max. permissible number		2	
	Δ Minimum allowable distance among defects		0.20 – 0.40 mm	
ΔΔ Elongated air bubble (permissible size)		Width	0.10 – 0.20 mm	0.10 – 0.30 mm
		Length	4.0mm	6.0 mm

Δ This also applies to the distance to major defects.

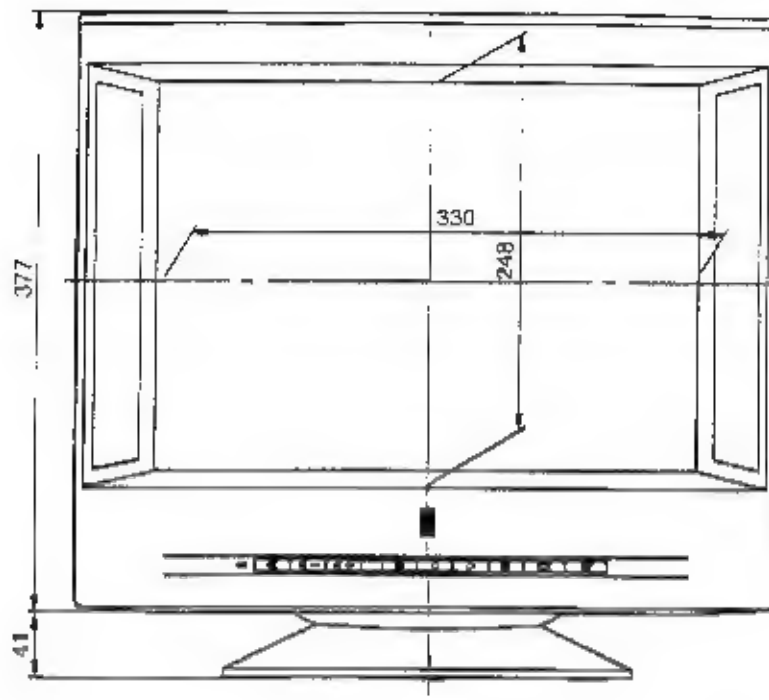
ΔΔ This should be evaluated by its average diameter, and then relevant standards of air bubble are applied; except number of defects for each zone, minimum distance among defects and maximum limit of average diameter.

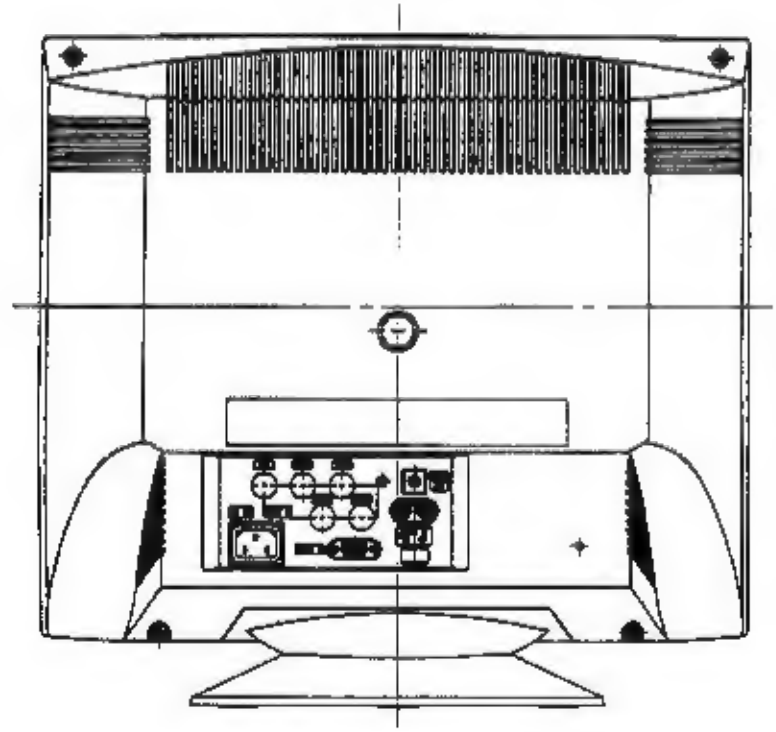
(B) Scratches

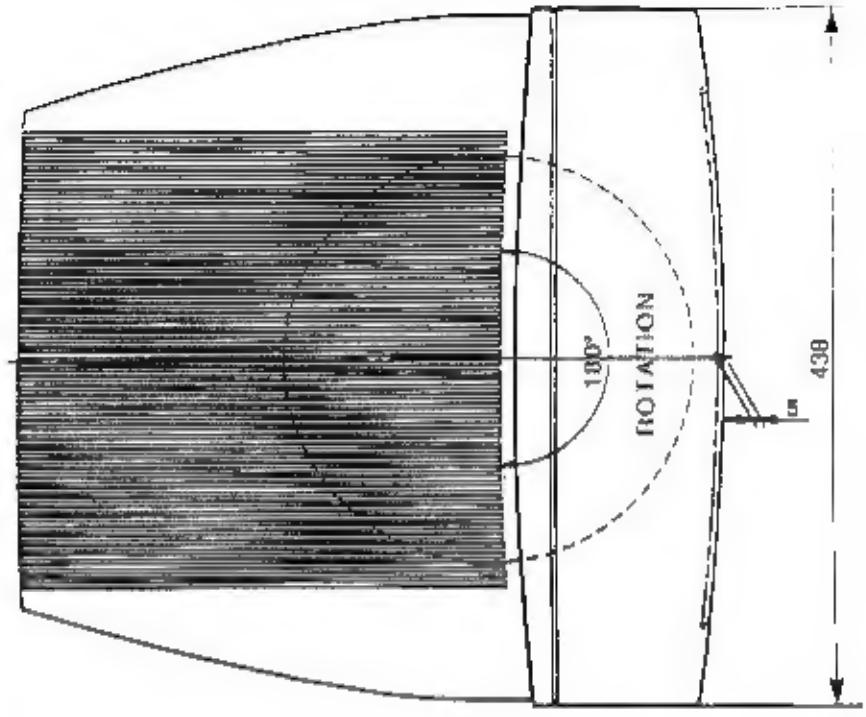
Width (mm)	Maximum allowable length (mm)
< 0.05	permitted
0.05 - 0.10	25.4
0.11 - 0.15	12.7
> 0.15	rejected

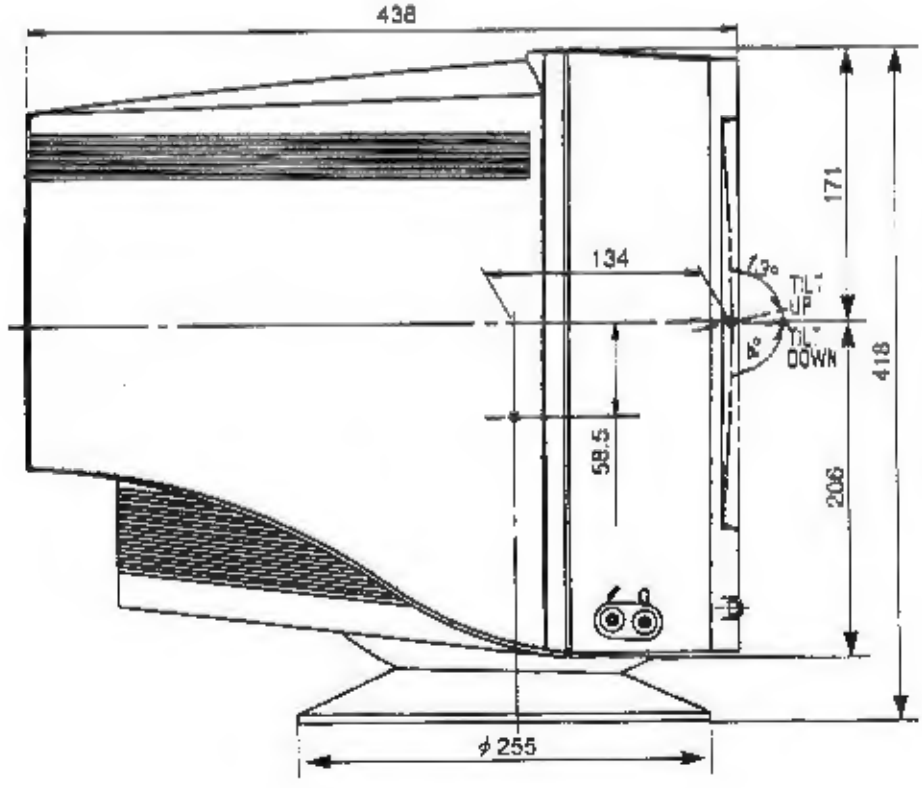
(C) Other defects not stated above such as chips, cracks, bruises, shear marks, clouds and polished patterns are not allowed when they substantially spoil appearance, viewed from the viewing distance

DIMENSIONS






180°
ROTATION
438
5

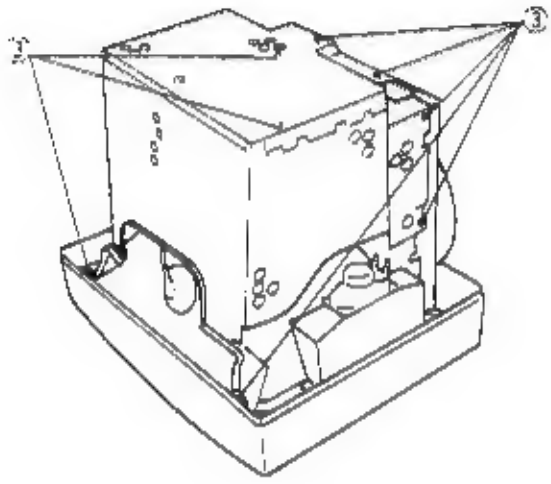

438
171
134
13°
TILT
UP
8°
TILT
DOWN
418
58.5
206
ϕ255

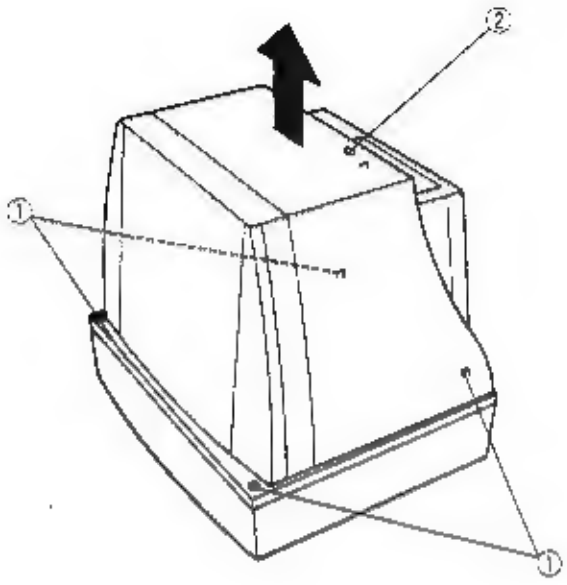
DISASSEMBLY INSTRUCTIONS

1. Rear cover removal

Note: Spread a mat underneath to avoid damaging the CRT surface.

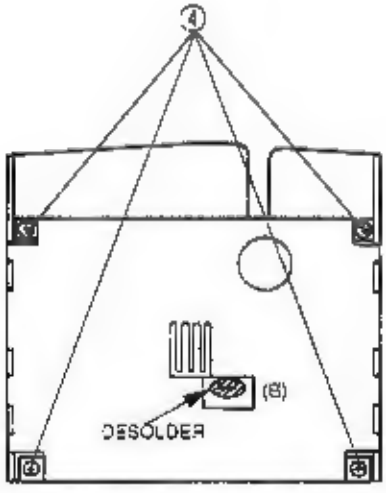
1) Remove the four large screws ① and the small screw ② from the rear cover.
2) Remove the cover.
3) Remove the eight screws ③ from the shield case.
4) Remove the shield case.



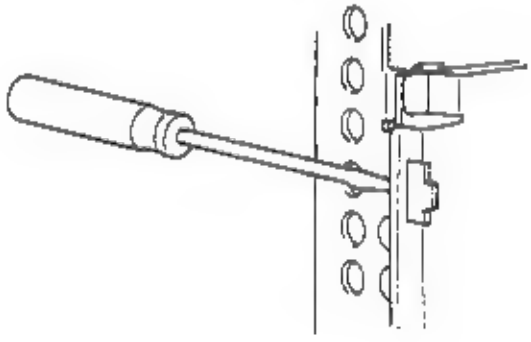


2. Video PCB removal

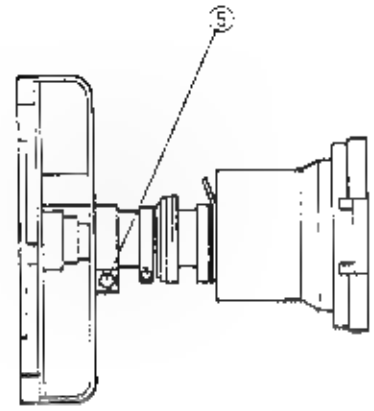
1) Remove the four screws ④ securing the shield cover.
2) Desolder (B) and Remove the shield cover (A).

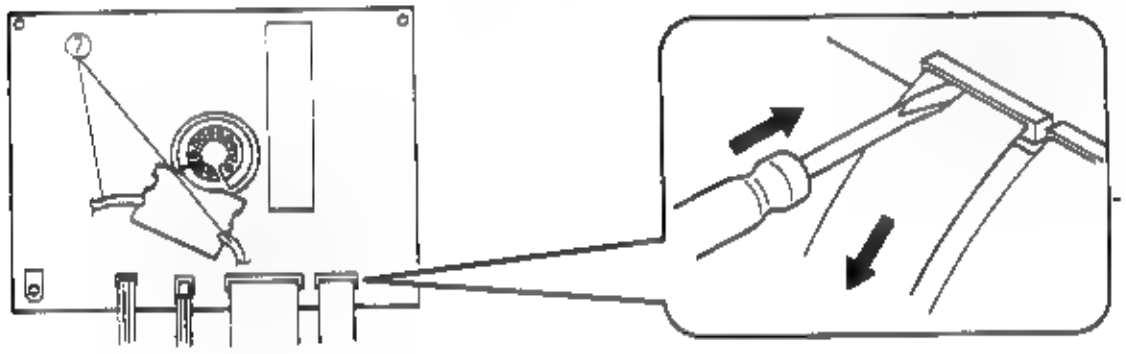


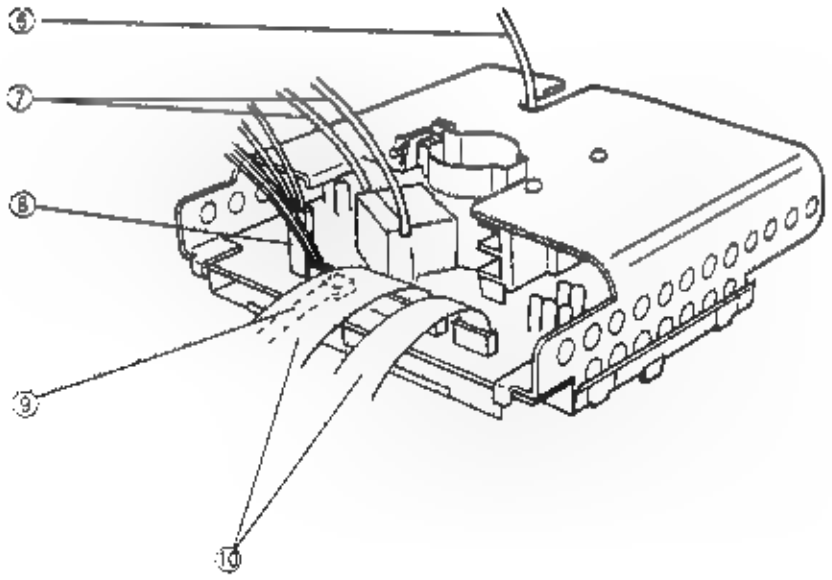
(A)



3) Loosen the screw ⑤ securing the CRT neck and the shield case
4) Remove the PCB block from the CRT.
5) Desolder and remove the N382B connector ⑥.
6) Remove the two focus leads ⑦ after pulling up the focus lead securing lever.
7) Remove the ground connector ⑧ (N106) connected to the PCB
8) Remove the two flexible PCBs ⑨.
9) Remove the N104B connector ⑩.
10) Remove the PCB from the shield case.

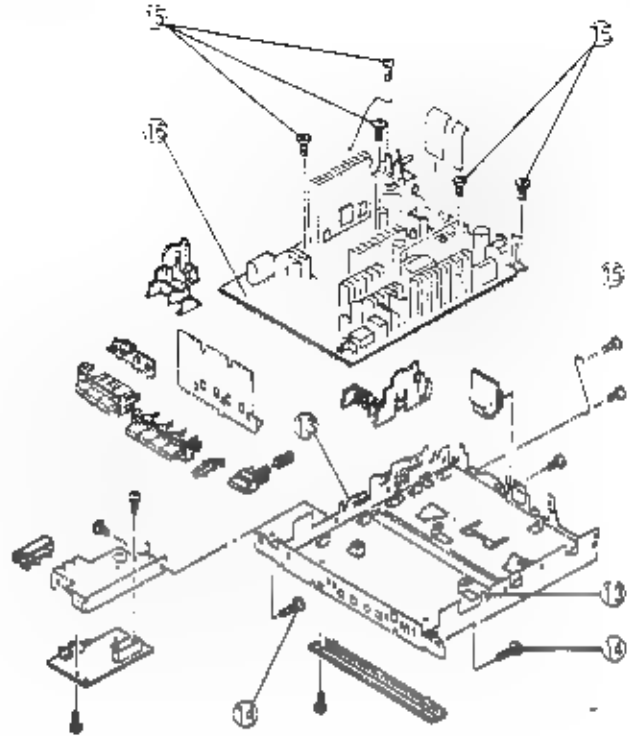


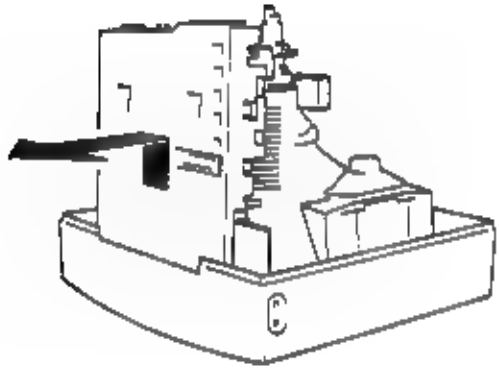


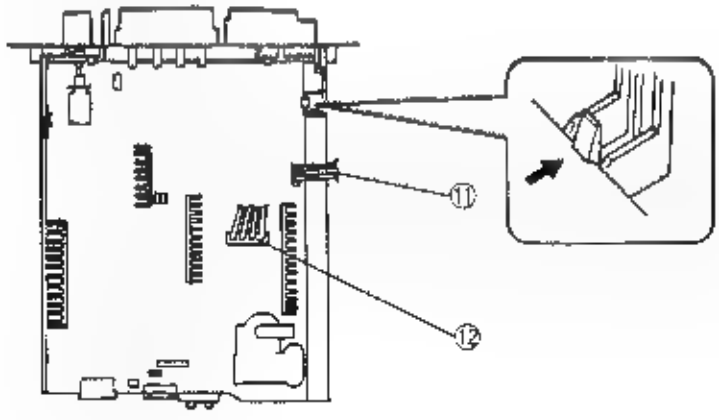


3. Main PCB Removal

1) Remove the connector (11) (N802) of the degauss coil.
2) Remove the DY connector (12)
3) Remove the anode cap.
4) Remove the two ground connector (13)
5) Move the CRT face down and remove the two screws, (14) securing the bottom fitting metal.
6) Remove the fitting metal and the PCB from the cabinet
7) Remove eight screw (15) securing the fitting metal and PCB
8) Remove the PCB (16) with the figure referenced.



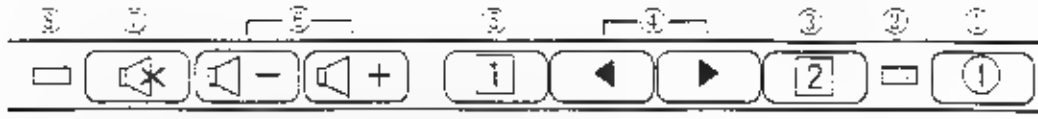




CONTROL LOCATION (MONITOR SECTION)

Basic operation of parts

Control panel



①	Power switch	To switch on and off the monitor.
②	Pilot LED	Light up green when power is ON : turns yellow in power management mode.
③	OSD 2 key	Selected or switch change data.
④	OSD ◀ ▶ key	(1) To display contrast menu ; to adjust contrast (2) To adjust level of selected item
⑤	OSD 1 key	To display main menu ; quit menu. Store change data in the memory.
⑥	Volume key	Adjusts the sound volume for the built-in speakers and the headphone terminals.
⑦	Mute key	Turns the built-in speakers and the headphone terminals sound ON and OFF.
⑧	Mute LED	Indicates that the built-in speakers are in mute operation

Examples of on-screen operation

A. Contrast adjustment

Display changes | Steps of operation | On-screen display changes

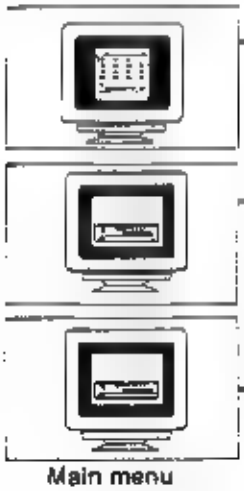
1. Display the contrast adjustment menu using the ◀ key or ▶ key.

< Contrast menu >

2. Set the desired state using the ◀ key or ▶ key. If the 1 key is pressed, the set data is stored in the memory and the menu screen is cleared.

B. H. size adjustment

Display changes | Steps of operation | On-screen display changes

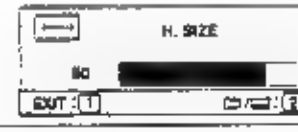


1. Call the main menu on the screen by pressing the 1 key.

< Menu >

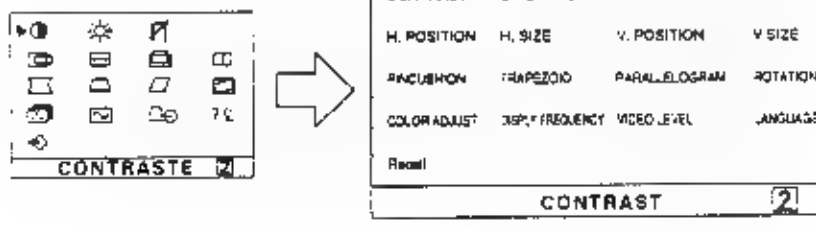
2. Move to cursor to H. SIZE using the ◀ key or ▶ key, then press the 2 key to select.

< Sub menu >



3. Set the desired state using the ◀ key or ▶ key. If the 1 (EXIT) key is pressed, the set data is stored in the memory and the menu screen is cleared.

Main menu



CAUTION FOR ADJUSTMENT AND REPAIR

1. Degaussing is inevitably required for purity adjustment or convergence adjustment.
2. If you check or adjust an electrical specification or function, more than 20 minutes burn-in is required.
3. Reforming of the lead wire is required after repair is completed.
4. Prior to starting work, be sure to check that the input signal is at the specified timing and that the polarity is as specified in all modes.
5. Brightness control: After mounting the rear cover, brightness tends to decrease about 5 cd/m^2 on a flat white field and about 1 cm/m^2 on a white raster field. This should be taken into consideration.
6. Brightness stabilizing time: It takes about 20 to 50 seconds for the brightness to stabilize after turning the power off for 5 seconds (AC). Therefore, care should be taken on this.
7. Aging should be made in white raster of 30 ~ 50 cd/m^2 and raster size of 320 x 240 mm before adjusting the ITC.
8. Set the CONTRAST to MAX and BRIGHTNESS to CENTER using the O S D.

CAUTION FOR SERVICING

When servicing or replacing the CRT, high voltage sometimes remains on the anode. Completely discharge high voltage before servicing or replacing the CRT in order to prevent a shock to the service person.

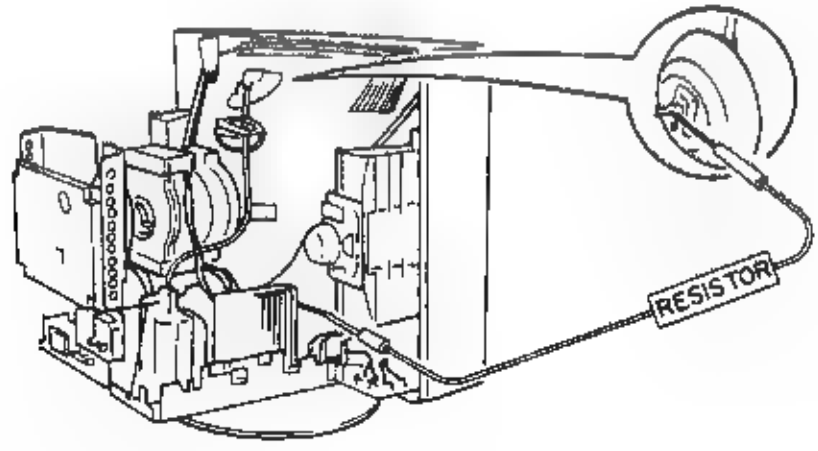
CRT Anode Discharge

1. When you check the CRT anode or replace the CRT, discharge the CRT anode to the external conductive coating (aquadag) of the CRT, especially when checked right after power turn-off.
2. Ground one end of a jumper wire which has a resistor (30 kV < resisting pressure 100 MΩ) and connect the other end to the CRT anode.

Note: Grounding must be done first.

This model has a section that does not share a common ground with the power supply section, the different sections are referred to as the HOT section and the COLD section in the precautions below.

1. Do not touch the HOT section and the COLD section at the time. You may be hit by an electric shock.
2. Do not short the HOT section to the SOLD section. This could blow the fuse or damage parts.
3. Never measure the HOT section and the COLD section at the time when using tools such as oscilloscopes or multimeters.
4. Always unplug the unit before beginning any operation such as removing the chassis.



ADJUSTMENT AND CHECK PROCEDURE

INTRODUCTION

- This monitor is controlled by a microcomputer. With the exception of purity/convergence/focus everything is digitally adjusted. Therefore, a computer, the dedicated control software, the dedicated interface, a 9~12 V power supply and a signal generator are required for servicing.

TOOLS REQUIRED

- **Computer**
  The control software is IBM PC compatible only.

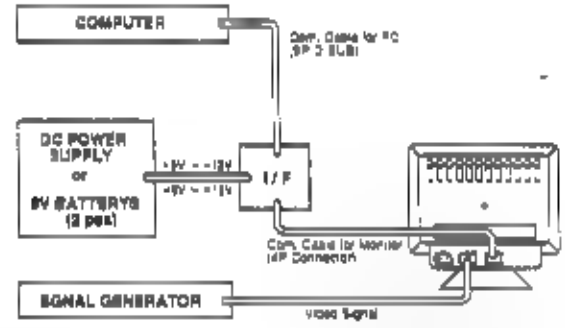
- **Control Software**
  The 17GA chassis can only use the "1769GA-1 adjustment program disk". No other program can access the EEPROM on the monitor. For further information, please contact our sales office.

- **Interface**
  The interface is dedicated to work only with the control software and the 17GA chassis. There are no substitutes for this interface. For further information please contact our sales office.

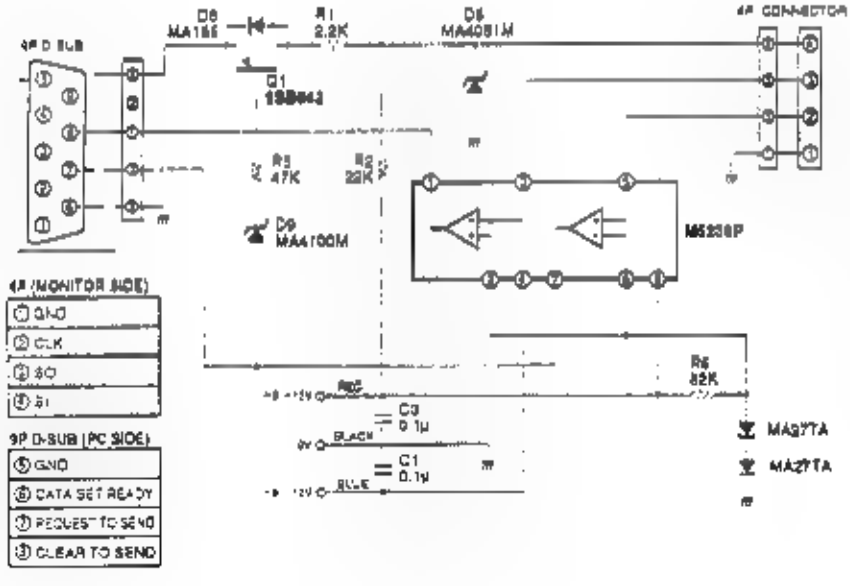
- **Power Supply**
  A DC 9~12 V (+9~12 V/–9~12 V) power supply is required for operating the interface.

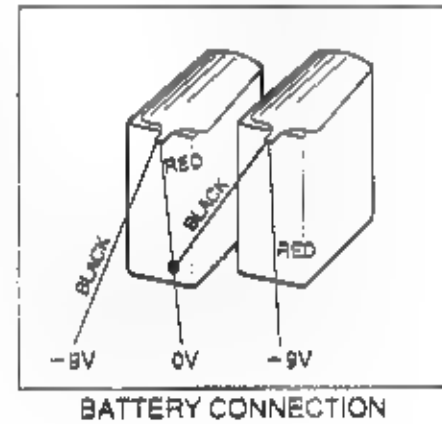
- **Signal Generator**
  It is necessary for you to use a signal generator which operates on fH 82 kHz, fV 160 Hz and fc 135 MHz bands.

INTERFACE CONNECTION



INTERFACE SCHEMATIC DIAGRAM





BATTERY CONNECTION

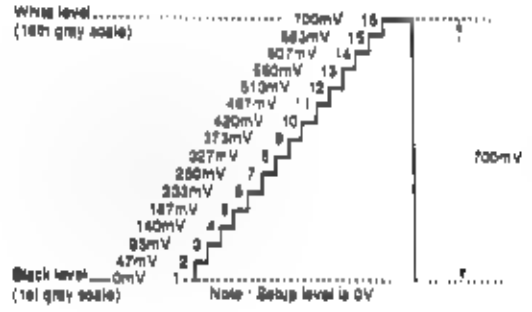
OTHER TOOLS

- Oscilloscope (dual trace)
- Scope probe – Attenuation: 100:1
  Attenuation: 10:1
- Digital Voltmeter – Range: 0 to 1000 V DC
  Accuracy: 0.1 %
- TV color Analyzer (– that reads luminance and chromaticity X and Y coordinates
- Digital High Voltmeter
- AC power supply – Output voltage: 0 to 300 V
- Degaussing coil
- Convergence meter
- Scale
- Double-faced scale
- Microscope – Scale factor: 50
- White lacquer (Paint)

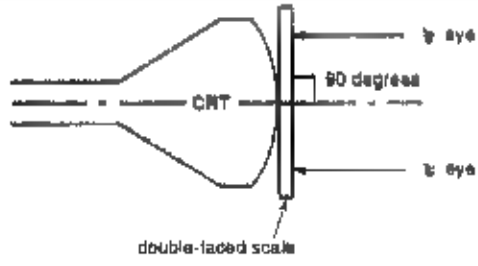
STANDARD CONDITION OF ADJUSTMENT PROCEDURE

• Signal timing :	Standard timing 1024 x 768 (See page 5)
• Display pattern :	White, full "H" character
• Signal level :	V/H: TTL level video: 700 mV
• Input source :	AC 120 V, 60 Hz
• Ambient temperature :	Room temperature
• Warm-up time	More than 30 minutes
• Brightness control :	Center
• Contrast control :	Max.
• Magnetic field :	Vertical: 40 μT Horizontal: 0 μT
• Signal cable :	Attached

Video input signal from PC.



- Use ■ Helmholtz device ■ adjust an unit with no horizontal magnetic field and a vertical field of 40 μT. Inspect the unit under the same conditions.
- The ambient illuminance must be 200 lux.
- Use an external degaussing coil any time the DEGAUSS switch does not remove color shading.
- To check the image width, height, linearity and distortion, proceed as below.



Measure level with respect to tube axis

ADJUSTMENT SOFTWARE

1. Software operating procedure

A) Power on the computer

B) Connect the Communication cable for monitor adjustment

C) Insert the adjustment disk into the drive.

D) At the A:\> prompt type "VSR", then press [ENTER].

> A function to identify the connected monitor is provided to prevent accidents due to erroneous use of the 17GA chassis program. If this program is used for any monitor other than the17GA, the message "This monitor is not an 17GA chassis. All further activity has been prevented" is displayed and the operation is stopped.

E) Refer to the adjustment procedures.

2. Adjustment Program

Main Menu of Adjustment Program

<<17GA ADJUST PROGRAM MAIN MENU>> (e: exit)			<Ver '.'>
1)	Load data from FILE	6)	Clear User preset
2)	Adjust H. OSC freerun	7)	Save data to FILE
3)	Adjust VSR setting	8)	Special ADJUST
4)	Adjust OTHER setting	9)	Information Service
5)	Adjust Factory preset	10)	Show Version & Error

Description of Function of Each Menu

1) Load Data from File
This transfers the data file from the disk to the EPROM on the monitor.

2) Adjust H.OSC Freerun
To guarantee that the full range of horizontal frequencies operate correctly, the reference oscillation frequency should be set.

3) Adjust VSR Setting
To guarantee that the full range of horizontal frequencies operate correctly, the reference voltage and the distortion offset data should be set.

4) Adjust Other Setting
This is used to control the brightness and color.

5) Adjust Factory Preset
Makes adjustments to the factory presets. This data is also referenced for modes other than the preset mode.

6) Clear User Preset
Clears the data written in the user preset domain. There is no data in the user presets when the product is shipped from the factory.

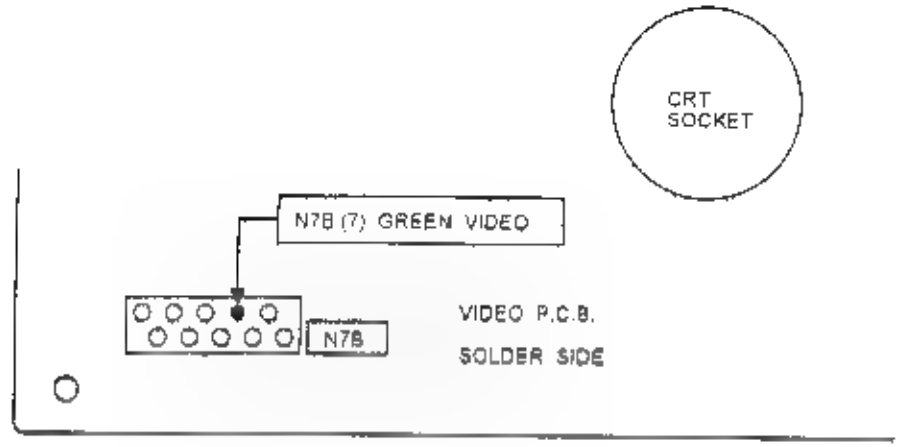
7) Save Data to File
Transfers the data from the EPROM on the monitor to a data file on a floppy disk or hard drive. The data file can be named anything as long as it is less that 8 characters long.

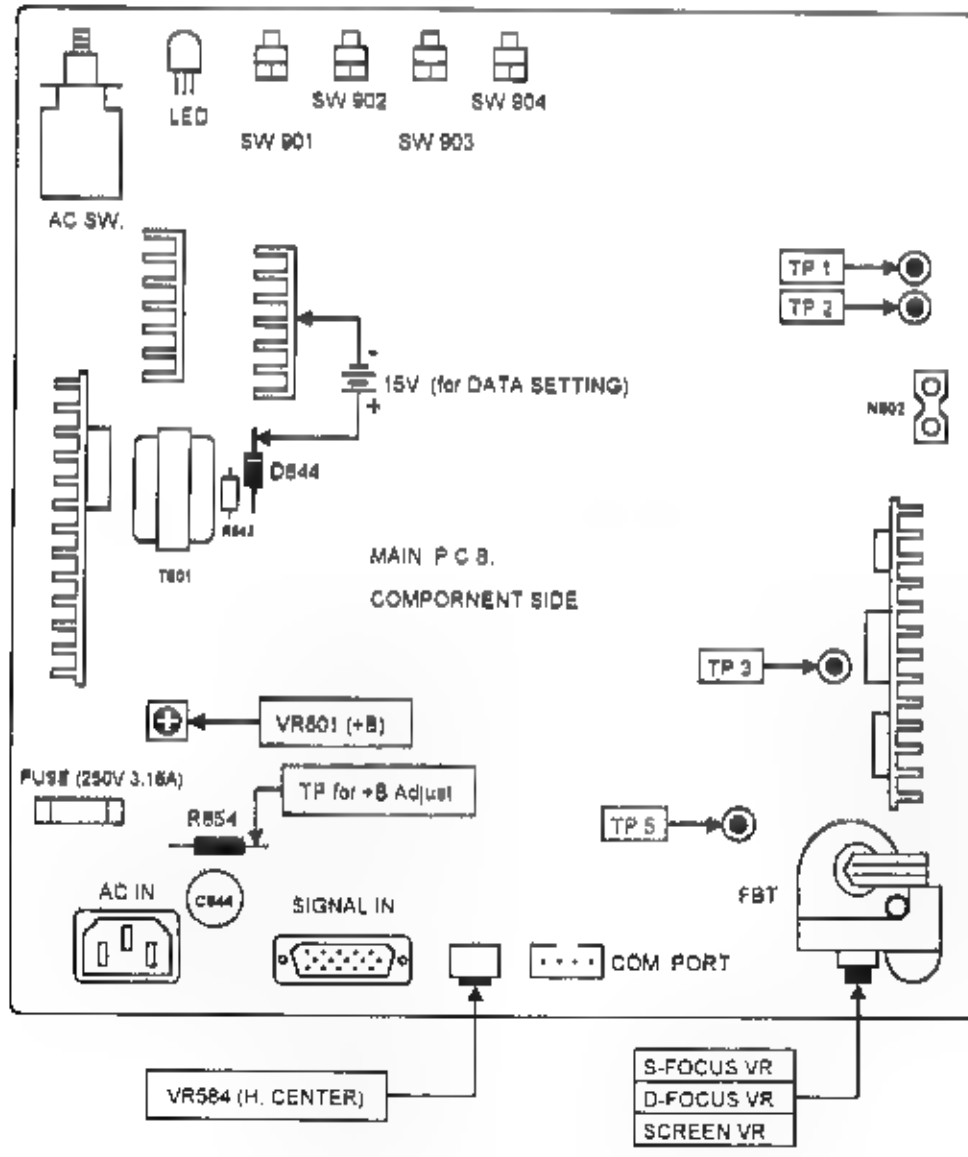
8) Special Adjust
This menu has the following functions
- Related data is automatically set on the basis of adjustment results to save the time for adjustment. (Example: color adjustment applies only to the 9300 K, while 6550 K and user color data are automatically set.)
- To prevent operation errors in changes of various type of control flags, these flags are automatically returned to the default settings (Final Tune).

9) Information Service
Displays the H/V frequencies that is being supplied to the monitor and gives the operational status of the monitor.

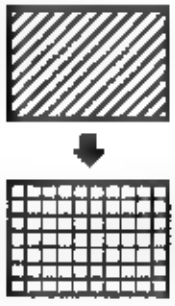
10) Show Version and Error
Shows the version of the microprocessor in the monitor. Also, if there is an error in the operation of the monitor, the error is displayed on the screen of the PC.

SERVICE ADJUSTMENT CONTROL LOCATION





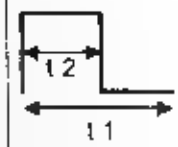
1. Description of Adjustment Method

	ITEM Program Menu	◇ Test Meter ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
A	STANDARD DATA SETTING 1) Load data from FILE	▼ D844 - GND Refer to service adjustment control location on page 29	A1 A2 A3 A4 AE		Do not connect the power and signal cable to monitor. Apply 15V to D844 CATHODE and GND. (Do not apply 5V to IC901. Because IC876 supply 5V and RESET signal to IC901) Set the cell to the menu at left and press ↵ A message FILE => EEPROM FILE NAME (q or Q escape) [ ] : is displayed. So key in the DACDATA.DAT (when using the standard data) and press ↵. Disconnect 15V cable, then turn on the power switch of the monitor.	
	Do not load standard data except when Main P.C.B. and EEPROM are replaced.					
S	**+B ADJUST**	◇ Digital voltmeter ▼ R864 Refer to service adjustment control location on page ■	■ ■	Mode-2	Check that the input signal to the monitor is [fH 60.0KHz] and [fV 75.0Hz] and press ■. Make the adjustment to the value shown at right by turning the VR801 on the main PCB.	98V +2 / -1V
C	**H. FREE RUN** 2) Adjust H. OSC freerun ...	□ Crosshatch	C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 CE	-1 -2 3 4 	Set the cell ■ the menu ■ left and press ↵. Set the cell to the adjusting mode INTP [0] and press ↵. Check that the input signal to the monitor is [fH 29.5KHz] and [fV 48.0Hz] and press ↵. When the screen image has stabilized, press ↵ to return to menu of C2. Input signal [fH 39.0KHz] and [fV 77.1Hz] Select Adjusting mode INTP [1], and repeat above procedure. Input signal [fH 54.0KHz] and [fV 105.0Hz] Select Adjusting mode INTP [2], and repeat above procedure. Input signal [fH 70.0KHz] and [fV 155.0Hz] Select Adjusting mode INTP [3], and repeat above procedure. Press E to return to main menu.	

Note 1 : Check to be sure that the program disk name is **1769GA-1** before making necessary adjustment.

Note 2 : Unless otherwise specified, the monitor state is as given at right.

Note 3 : The underlined places indicate the adjustment items on the screen of the PC.

ITEM Program Menu	◇ Test Meter ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
D	H. DRIVE DUTY 2) Adjust VSR setting	◇ Oscilloscope ▼ TP2 ~ GND □ Crosshatch Oscilloscope Range -1 10μs/div -2 5μs/div -3 5μs/div -4 2μs/div	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 DE	 -1 -2 -3 -4 	Set the cell to the menu at left and press ↵. Set the cell to the adjusting mode INTP [0] and press ↵. Check that the input signal to the monitor is [fH 29.5KHz] and [fV 48.0Hz] and press ↵. Set the cell to H. DRIVE DUTY and press ↵. Make the adjustment to the value shown at right by using ← and →. Register by pressing ↵ and return to menu of D2 by pressing ⓒ. Input signal [fH 39.0KHz] and [fV 77.1Hz] Select Adjusting mode INTP [1], and repeat above procedure. Input signal [fH 54.0KHz] and [fV 105.0Hz] Select Adjusting mode INTP [2], and repeat above procedure. Input signal [fH 70.0KHz] and [fV 165.0Hz] Select Adjusting mode INTP [3], and repeat above procedure. Press ⓒ to return to main menu.	 t2 - t1 × 100 = 55% ±3% 51% ±3% 48.5% ±3% 46% ±3%
E	■. DRIVE +B 2) Adjust VSR setting	◇ Digital voltmeter ▼ TP1 ~ GND ■ Crosshatch	E1 ■ E3 ■ E5 ■ E7 E8 E9 E10 E11 E12 EE	 -1 -2 -3 -4 	Set the cell to the menu at left and press ↵. Set the cell ■ the adjusting mode INTP [0] and press ↵. Check that the input signal to the monitor is [fH 29.5KHz] and [fV 48.0Hz] and press ↵. Set the cell to H. DRIVE +B and press ↵. Make the adjustment to the value shown ■ right by using ← and →. Register by press ↵ and return to menu of E2 by press ⓒ Input signal [fH 39.0KHz] and [fV 77.1Hz] Select Adjusting mode INTP [1], and repeat above procedure. Input signal [fH 54.0KHz] and [fV 105.0Hz] Select Adjusting mode INTP [2], and repeat above procedure. Input signal [fH 70.0KHz] and [fV 165.0Hz] Select Adjusting mode INTP [3], and repeat above procedure. Press ⓒ to return to main menu.	 19.0V ±0.3V 18.5V ±0.3V 18.5V ±0.3V 15.0V ±0.3V

	ITEM Program Menu	◇ Test Meter ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
F	EHT ADJUST 3) Adjust VSR setting 8) Special ADJUST	◇ Digital voltmeter ▼ TP5 ~ GND □ RGB off (Sync only)	F1 F2 F3 F4 F5 F6 F7 F8 FE	-4	Set the cell to the menu at left and press ↵ Set the cell to the adjusting mode INTP[3] and press ↵ Check that the input signal to the monitor is [fH 70.0KHz] and [fV 165.0Hz] and press ↵. Move the cell to EHT and press ↵ Make adjustment to the value shown at right by using ← and →. Register by pressing ↵ and return to the main menu by pressing ⊡. Set the cell to the menu at left and press ↵. Select the 5: EHT DATA CALCULATION from the menu. The computer will then display : **Calculate EHT data automatically · OK ?** Press ↵ to return to menu of F8, press ⊡ to return to the main menu (When selected above menu calculation is done automatically for -1, -2 and -3)	146.0V ±1V
G	H. CENTER	□ RGB off (Sync only)	G1 G2 G3	Mode-8	Set the Brightness to MAX. Check that the input signal to the monitor is [fH 57.8KHz] and [fV 71.8Hz]. Make the adjustment as shown ■ right by turning the VR854 on the main PCB	A A=B B Back raster Set the raster to the center with respect to the bezel.

	ITEM Program Menu	◇ Test Meter ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
H	H/V. SIZE, POSI and V. PCC (1) 5: Adjust Factory preset	□ Crosshatch	H1		Set the cell to the menu at left and press ↵.	
			H2	Mode-1	Check that the input signal to the monitor is [fH 31.5KHz] and [fV 60.0Hz] and press ↵	
			H3		Set the cell to following items, press ↵ and make the adjustment to the value shown at right by using ← and → ① H. SIZE ② H. POSI ③ V. SIZE ④ V. POSI ⑤ V. PCC ⑥ PARALLELOGRAM ⑦ TRAPEZOID	H 300mm ±5 V 225mm ±5 H/V Posi : Center V PCC : Best point
			H4		After adjusting the above, return to menu of H2 by using ↑ and ↓.	
			H5	Mode-2	Input signal [fH 60.0KHz] and [fV 75.0Hz] and repeat above procedure.	H : 300mm ±5 V : 225mm ±5
			H6		After adjustment, go to H7 by using ↑ and ↓	
			H7	Mode-3	Input signal [fH 63.7KHz] and [fV 60.0Hz], and repeat above procedure.	H : 286mm ±5 V : 229mm ±5
			HE		After adjustment, return to the main menu by using ↑ and ↓.	-
I	H/V. SIZE, POSI and V. PCC (2) 3) Adjust VSR Setting	□ Crosshatch	I1		Set the cell to the menu at left and press ↵.	
			I2		Set the cell to the adjusting mode INTP [0] and press ↵	
			I3	-1	Check that the input signal to the monitor is [fH 29.5KHz] and [fV 48.0Hz] and press ↵	
			I4		Set the cell to following items, press ■ and make the adjustment to the value shown ■ right by using ← and → ① H. SIZE ② H. POSI ③ V. SIZE ④ V. POSI ⑤ V. PCC ⑥ V. LIN (S)	H : 300mm ±5 V : 225mm ±5 H/V Posi : Center V. PCC : V. LIN : Best point
			I5		After adjusting the above, return to menu of I2 by using ↑.	
			I8	-2	Input signal [fH 39.0KHz] and [fV 77.1Hz]	
			I7		Select Adjusting mode INTP [1], and repeat above procedure.	
			I8	-3	Input signal [fH 54.0KHz] and [fV 105.0Hz]	
			I9		Select Adjusting mode INTP [2], and repeat above procedure	
			I10	-4	Input signal [fH 70.0KHz] and [fV 155.0Hz]	
			I11		Select Adjusting mode INTP [3], and repeat above procedure.	
			IE		After adjustment, return to the main menu by press ↑.	

ITEM Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
CRT CUT-OFF	◇ TV Color Analyzer II	J1		Set the Contrast to MAX. Brightness to Center and Color is 9300k using the OSD.	
	☐ RGB Off (Sync only)	J2	Mode-2	Check that the input signal to the monitor is [fH 60.0KHz], [fV 75.0Hz] and turn off the RGB signal	
4) Adjust OTHER setting		J3		Set the cell to the menu at left and press ↵	
		J4- J11		Make the adjustment R,G and B Low Light by using ←, → and Screen VR to CRT cut-off **Please refer to flow chart for this adjustment on page 30.**	
	☐ 16 gradation grayscale	J12 J13		Change to the pattern at left Adjust the screen VR so the 2nd level of gray appears slightly.	
BRIGHTNESS COLOR ADJUST	☐ White window (5cm×5cm at center)	J14 J15		Change to the pattern at left. Move the cell to the following items and make the adjustment to the value shown at right by using ← and →. R. SUB CONT 9300K G. SUB CONT 9300K B. SUB CONT 9300K	Y=120 cd/m² x=0.281 ±0.15 y=0.311 ±0.15
		J16 J17		Set Contrast to MIN using the OSD Move the cell to the following items and make the adjustment to the value shown at right by using ← and →. R. LOW LIGHT 9300K G. LOW LIGHT 9300K B. LOW LIGHT 9300K **Adjust two colors only out of above three as shown in (J11) on page 30.**	x=0.281 ±0.15 y=0.311 ±0.15
ABL	☐ White flat field (full window)	J18 J19		Change to the pattern at left. Move the cell to ABL 9300K and make the adjustment to the value shown at right by using ← and →.	Y=110 cd/m²
		J20		Press ↩ to return to main menu.	
1.0V ADJUST 8) Special ADJUST	☐ White window (5cm×5cm at center) 1.0V p-p video*	J21 J22 J23		Change to the pattern at left.* Set the cell to the menu at left and press ↵. Select the 1:VIDEO 1.0Vpp ADJUST from the menu.	
		J24 J25		Set Input Video Level 1.0V using the OSD of the monitor.	Y=120 cd/m²
		J26 JE		Make the adjustment to the value shown at right by using ← and →. Press ↵ to return to menu of J19, press ↩ to return to the main menu.	
Should make Final Tune after this adjustment refer to item L on page 31.					

CRT CUT-OFF ADJUSTMENT

WARNING

Do not turn the screen VR after this adjustment.

J4 Data set : Change data value to "FF" for R,G,B Low Light 9300K
Program Menu . 4) Adjust OTHER setting

Signal : Turn off the R,G,B (sync signal only)

J5 Set screen VR fully counterclockwise (Min)

J6 Turn screen VR until the raster appears with any one of three (R,G,B) colors

If Red appears in J6

J7 Set
- R Low Light 9300K -
Value to "00"

J8 Turn screen VR until the raster appears with any one of two (G or B) colors.

If Green appears in J8

J9 Set
- G Low Light 9300K -
Value to "00"

J10 Adjust Screen VR to
"0.46 cd/m²"
for Blue raster

J11 Adjust
- R Low Light 9300K -
- G Low Light 9300K -
to (x=0.281 y=0.311)

If Blue appears in J8

J9 Set
- B Low Light 9300K -
Value to "00"

J10 Adjust Screen VR to
"3.65 cd/m²"
for Green raster

J11 Adjust
- R Low Light 9300K -
- B Low Light 9300K -
to (x=0.281 y=0.311)

If Green appears in J6

J7 Set
- G Low Light 9300K -
Value to "00"

J8 Turn screen VR until the raster appears with any one of two (R or B) colors.

If Red appears in J8

J9 Set
- R Low Light 9300K -
Value to "00"

J10 Adjust Screen VR to
"0.46 cd/m²"
for Blue raster

J11 Adjust
- R Low Light 9300K -
- G Low Light 9300K -
to (x=0.281 y=0.311)

If Blue appears in J8

J9 Set
- B Low Light 9300K -
Value to "00"

J10 Adjust Screen VR to
"0.89 cd/m²"
for Red raster

J11 Adjust
- G Low Light 9300K -
- B Low Light 9300K -
to (x=0.281 y=0.311)

If Blue appears in J6

J7 Set
- B Low Light 9300K -
Value to "00"

J8 Turn screen VR until the raster appears with any one of two (R or G) colors

If Red appears in J8

J9 Set
- R Low Light 9300K -
Value to "00"

J10 Adjust Screen VR to
"3.65 cd/m²"
for Green raster

J11 Adjust
- R Low Light 9300K -
- B Low Light 9300K -
to (x=0.281 y=0.311)

If Green appears in J8

J9 Set
- G Low Light 9300K -
Value to "00"

J10 Adjust Screen VR to
"0.89 cd/m²"
for Red raster

J11 Adjust
- G Low Light 9300K -
- B Low Light 9300K -
to (x=0.281 y=0.311)

J12 Adjust screen VR so the 2nd level of gray appears slightly (Test pattern . 16 gradation grayscale)

	ITEM Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
K	FOCUS	☐ Character	K1	MODE-2	Check that the input signal to the monitor is [fH 60.0KHz] and [fV 75.0Hz].	
			K2		Make the corner sections of the screen optimum by turning D-FOCUS VR on the FBT	
			K3		Make the center section optimum by turning S-FOCUS VR on the FBT	
			K4		Repeat K2 and K3 to make it optimum	
L	FINAL TUNE 8) Special ADJUST		L1		Set the cell to the menu at left and press ↵	
			L2		Select the 8 FINAL TUNE from the menu. (Step 1).Data tuning. This messages will appear : **<loading EEPROM data> ...end** **<tuning EEPROM data> ... end** **<saving data to EEPROM> ... end** **<RECALL data - PRESET data> wait a moment**	
			L3		(Step 2).Erase user preset data. **Erase All ' user preset data OK ? >** Press Y, ■, ■ to L6.	
			L4		(Step 3):Calculate color data. **COLOR 6550K data OK ? >**, press Y ↵.	
			L5		**USER COLOR data OK ? >**, press Y ↵.	
			L6		**ABL data OK ? >**, press Y ↵ **finished . (Hit return key)**	
			L7		Press ↵, go to L8.	
			L8		(Step 4):Set brightness data and flag. **BRIGHT click data OK ? >**, press Y ↵.	
			L9		**BRIGHT min./max. limiter automatically OK ? >**, press Y ↵. **end** **<SET FLAG>** **wait a moment ... end** **tune end .** **Hit return key !**	
			L10		Press ↵, return to menu of L2.	
			LE		Press F1 ■, to return to the main menu	
M	DATA SAVING 7) Save data to file		M1		Set the cell to the menu at left and press ↵.	
			M2		Key in the file name after [ ] :. Use serial number as a file name (EXAMPLE : FF5110001 = "F5110001.DAT")	

2. Purity adjustment

The CRT is an ITC assembly. However, here is the explanation for readjustment just in case.
If the color shading is apparent, make the following adjustment.

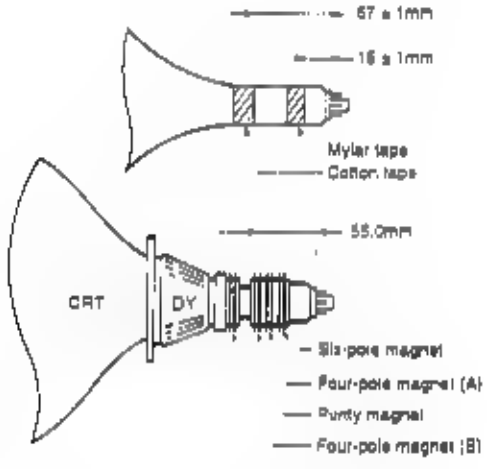
2.1

(1) Verify that no unusual magnetic fields are near the Display unit (magnetic screwdriver's table magnets, etc.). If possible, use a wooden workbench for this procedure.
(2) Degauss the magnetism of chassis and CRT with external degaussing coil.
(3) Adjust the purity magnet until each of the red, green and blue channels is free of color shading.

Make the following adjustment if color shading cannot be corrected by the above, or if the CRT or deflection yoke has been replaced.

2.2.

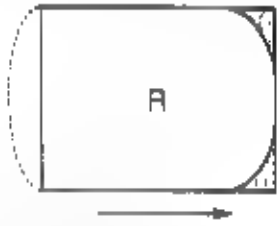
(1) Keep the convergence yoke and deflection yoke in the positions shown below.



CY tightening torque: 8 $^{+1}_{-1}$ kgf·cm
DY tightening torque: 18 ±2 kgf·cm

(2) Make sure that this adjustment is done later than 30 minutes after power on.
(3) Degauss the magnetism of chassis and CRT with an external degaussing coil.
(4) Verify that static convergence is roughly matched. If it is misaligned, adjust static convergence of Red color and Blue color with Four-pole magnet A.
For this adjustment Four-pole magnet B which is with the deflection yoke must be put together.
(5) Remove the wedge from the deflection yoke, and pull the deflection yoke fully to the front.
(6) Display green color solely with the signal generator. Adjust the purity magnet so that the center of the screen displays a pure green disk. Slide the deflection yoke rearward until the four corners are shaded and check the area's uniformity.

(7) After the adjustment of step 5, readjust the static convergence if some gap was found.
Static convergence alignment for this step is to be performed with Four-pole magnet A and Six-pole magnet.
(8) Display red disk. Adjust the purity magnets such that the red disk ■ at the center of the screen simultaneously. If red is shifted, move its position to the opposite direction.



(9) Display Green again.
Slide the deflection yoke rearward until the screen appears green on the whole, and fasten it there.
(10) Confirm purity in each direction by rotating the set to the East, West, South, and North after degauss by external degaussing coil.
(11) If magnetism remains even after the adjustment, use the compensation magnet to obtain purity.

The final confirmation method for purity

In the natural magnetic field, rotate the monitor to the East, West, South, and North.
The earth's magnetic field may cause magnetism on the monitor. Confirm that the automatic degaussing circuit built in the monitor can erase the amount of magnetism which was introduced with the above rotation.

3. Convergence adjustment

The CRT is an ITC assembly. However, here is the explanation for readjustment just in case.

(1) Make sure that this adjustment is done 30 minutes or later after power on. Check that the general ability coarse adjustment and purity adjustment are finished.

(2) Degauss the magnetism of chassis and CRT with the degaussing coil. (CRT board also)

(3) Apply mixed crosshatch signals of red and blue from the signal generator. Nudge the deflection yoke to equal its inclination up and down, right and left with a temporary wedge between CRT and the top of the yoke.

(4) Match the red and blue images at the center of the screen by rotating the Four-pole magnet A (See STEP-1 in figure for examples). For this adjustment Four-pole magnet A should be put together.

(5) Apply mixed crosshatch signal of red, blue and green from the signal generator.

(6) Match the red, green and blue images at the center of the screen by rotating the Six-pole magnet. (See STEP-2 in figure for examples)

(7) **If lines are twisted either to the left or to the right (See the STEP-3 ■ figure for examples) perform the following:**

   a. Use Four-pole magnet ■ to shift convergence of horizontal lines by 5 to 6 mm at the center of the screen. (For twisted lefthand lines, shift blue line downward and red line upward. For twisted righthand lines, shift red line downward and blue line upward. Do not shift convergence of vertical lines.)

   b. **Realign convergence with Four-pole magnet A.**

(8) Loosen the deflection yoke fastening screw and gently nudge the yoke up and down to achieve the best overall convergence on the edges of the screen (See STEP-4 in figure for examples).
Insert wedge at the top of the deflection yoke so that the convergence will not deviate due to an unsteady deflection yoke.

(9) Gently nudge the yoke from side to side to achieve the best overall convergence on the edges of the screen (See STEP-5 in figure for examples).
Insert wedges at the left side and right side of the deflection yoke so that the convergence will not deviate due to an unsteady deflection yoke. (Do not apply silicon adhesive to the wedges to prevent them from slipping out).

(10) Check that the image is horizontal.
If needed, rotate the deflection yoke.

(11) Recheck the purity adjustment. If purity was adversely affected repeat the purity adjustment, then recheck convergence when finished.

(12) Retighten the deflection yoke fastening screw. Do not overtighten the screw, as this can damage the CRT.
Tightening torque: 18 ± 2 kgf-cm

(13) Align the horizontal line convergence at the center of the screen with the Differential coil (See STEP-6 in figure for examples).

(14) Align the horizontal line convergence at the corner and of the screen with the Differential resistor VR-YV (See STEP-7 in figure for examples).

(15) Align the center vertical line convergence at the corner of the screen with the Vertical isotropic Astigmatism resistor VR-YH (See STEP-8 in figure for examples).

(16) Recheck convergence at the center of the screen. If needed, realign with the Four-pole magnet A and the Six-pole magnet.

(17) Insert wedges as shown in STEP-9 of figure (at the top, bottom, and right side of the deflection yoke). Secure them with silicon adhesive and polyester tape. Remove any temporary wedges while keeping convergence aligned.

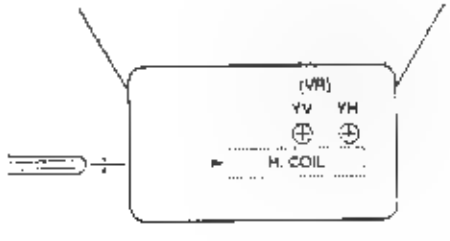
(18) If the convergence on the fringe areas in still not acceptable, place one or more Permalloys around the funnel to achieve the best effect. Then cross these Permalloys onto the funnel. Verify convergence around all edges of the screen. (See STEP-10 in figure for examples)

NOTE

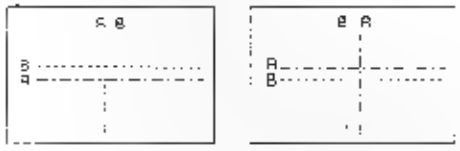
In the above step, do not place the Permalloys closer than 20 mm from the HV anode cap. Do not tape them over any paper labels or secure them with silicon adhesive.

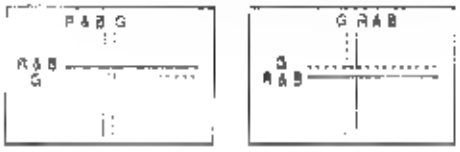
(21) After completion of adjustment, apply locking paint to the movable portions of the deflection and convergence yokes to secure them.

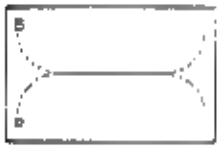
(22) Make adjustment ■ that the value of white window pattern from the signal generator is ■ ow that under the condition of 100 cd/m² brightness ■ the standard condition.



Adjustment part	Misconvergence pattern Wedge inserting position
Four-pole magnet A	**STEP-1**
Six-pole magnet	**STEP-2**
Four-pole magnet B	**STEP-3**
Deflection yoke	**STEP-4**



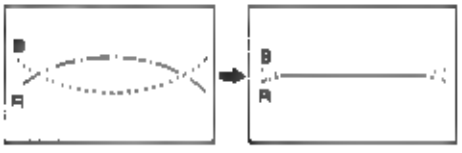




Beams are twisted lefthand

Beams are twisted righthand

for example (lefthand)

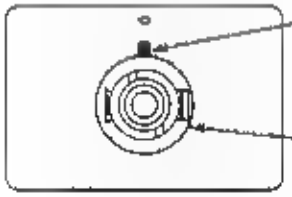


with four-pole magnet B

with four-pole magnet A

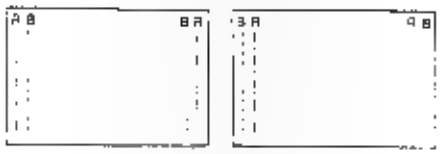
Tilting the yoke up

Tilting the yoke down



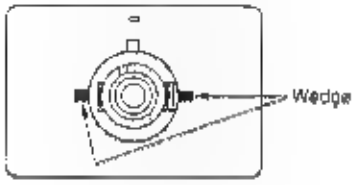
Rear view of the CRT

Adjustment part	Misconvergence pattern Wedge inserting position
Deflection yoke	**STEP-5**
Differential coil	**STEP-6**
Differential resistor VR-YV	**STEP-7**
Differential resistor VR-YH	**STEP-8**
	STEP-9
Permalloy	**STEP-10**

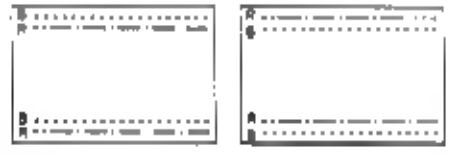


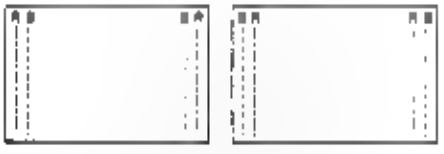
Tilting the yoke left

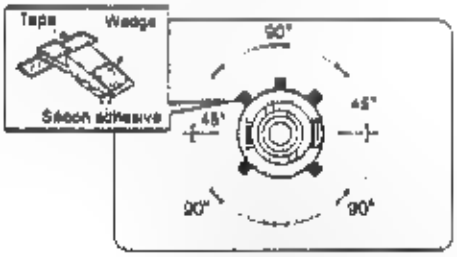
Tilting the yoke right



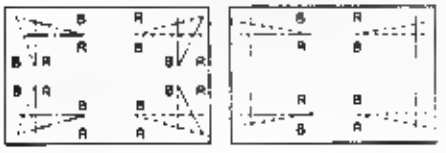
Rear view of the CRT







Wedge spacing and how ■ tape

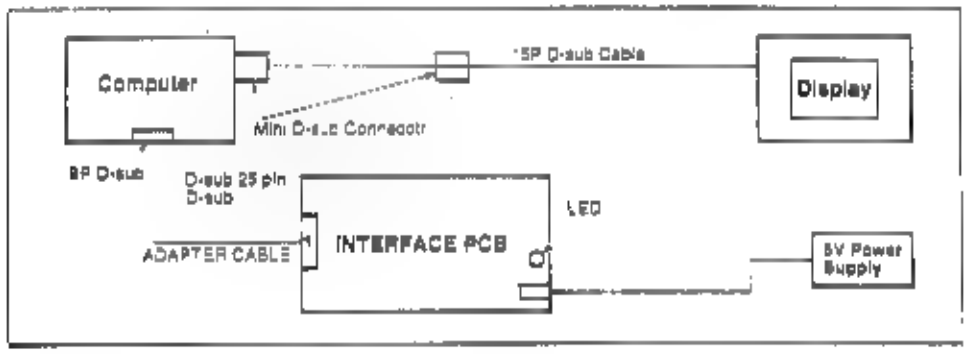


TECHNICAL INFORMATION FOR DDC

- It must be noted that this monitor is designed to be applicable to DDC1 communication. The following points are different from ordinary monitors.
  1. Use the signal cable ... which is furnished as an accessory (applicable to DDC1) only.
  2. When replacing a PCB on which ROM for DDC1 is mounted, data writing is required. Proprietary interfacing and software is required for reading or writing the data. Please contact our sales office for further information.
     In addition to the above, a computer applicable to WINDOWS and a 5V power supply unit are required.

- DDC1 Data Read/write System
  1. Communication jig
     (1) The composition of Communication jig
     ① Interface PCB. ② Adapter cable (D-SUB 25P - 9P) ③ 15P D-SUB cable

     (2) Connection diagram for communication jig.

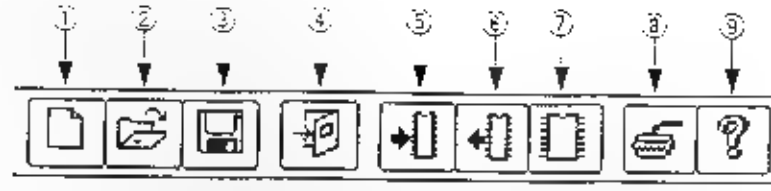


     (3) Procedure to turn on the power:
     ① Make connections as shown above
     ② Turn on the computer.
     ③ Turn on the power supply of communication jig.
     ④ Turn on the power supply of the MONITOR.
     (Note) If the above-mentioned operation is normal, LED of the communication jig turns green after step (4)
     If this LED is red, repeat steps (3) and (4)

     (4) Confirmation of DDC mode
     LED is mounted on the communication jig. According to its color, the DDC mode can be found.
     - When LED is green. DDC1 mode.
     - When LED is orange. DDC2B mode.
     - When LED is red Transmission error.
     - When LED is not lit. Obsolete.

2. Preliminary arrangements for using DDC data read/write software
   (1) Copy DDC WRITE. EXE from floppy disk to hard disk drive (Name: ＼View Tool Directory).
   (2) Register DDC data read/write software (DDCWRITE.EXE) in the icon.
   ① Click the menu bar "Icon" of the program manager.
   ② Select "register and group create" from the pull down menu.
   ③ Select "group create."
   ④ Name the group ViewTool and register the group.
   ⑤ Repeat (1) and (2) again and select "Icon registration"
   ⑥ Enter "DDC1/2B" for [Title] and "Hard disk drive name: ＼ViewTool＼DDCWRITE. EXE" for [Command line]. Then select [OK]
3. How to use DDC data read/write software.
   (1) **Start the DDC data read/write software.**
   Double-click on the "DDC1/2B" Icon in the View Tool group.
   (2) Meaning of ■ button displayed.
   The tool bar indicates the nine icons shown below.

These icons are explained, from left to right.



Icon ①: Initialization of screen display contents.
Icon ②: File is opened and displayed on the screen.
Icon ③: Data is stored in a file.
Icon ④: Exit the DDC data read/write software.
Icon ⑤: Data displayed on screen is written to EEPROM.
Icon ⑥: Contents of EEPROM are displayed on the screen.
Icon ⑦: Contents of EEPROM are compared with the data displayed on the screen.
Icon ⑧: Communication port setting.
Contents of setting PORT → Using Communication port No.
Baud rate → 9600, Data → 8 bits, Parity → Nil, Stop → 1 bits
Icon ⑨: Version information display.

(3) **Using the tool bar explained in (2) above, write data to EEPROM and do reading operations. A pop-up window may be displayed; in such case, select according to the message.**

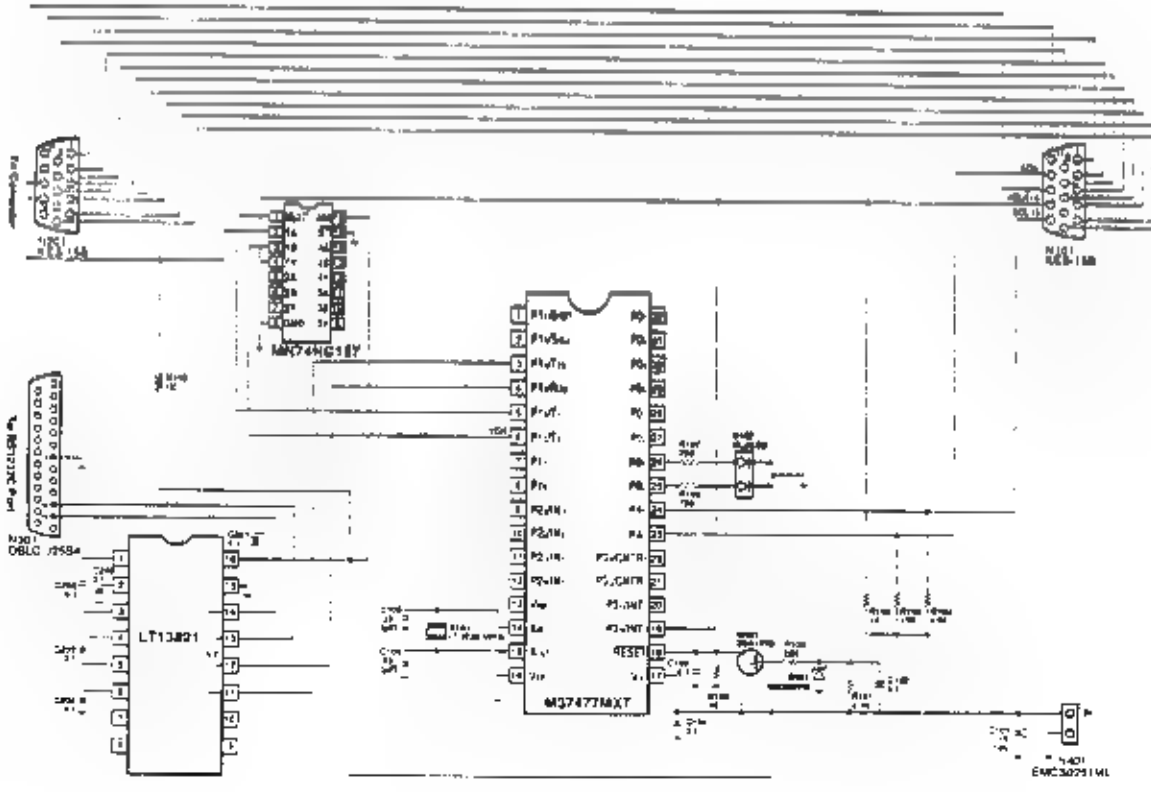
(Example 1) **EEPROM data is displayed on the screen.**

1. **Click on the icon (6th from the left) in the tool bar, with the arrow pointing from the memory chip.**
2. **Decide whether reading is started in DDC1 mode or DDC2B mode.**
3. **Select START.**

(Example 2) **Data displayed on the screen is written in EEPROM.**

1. **Click the icon (5th from the left) in the tool bar with the arrow pointing toward the memory chip.**
2. **Select START.**

SCHEMATIC DIAGRAM FOR INTERFACE

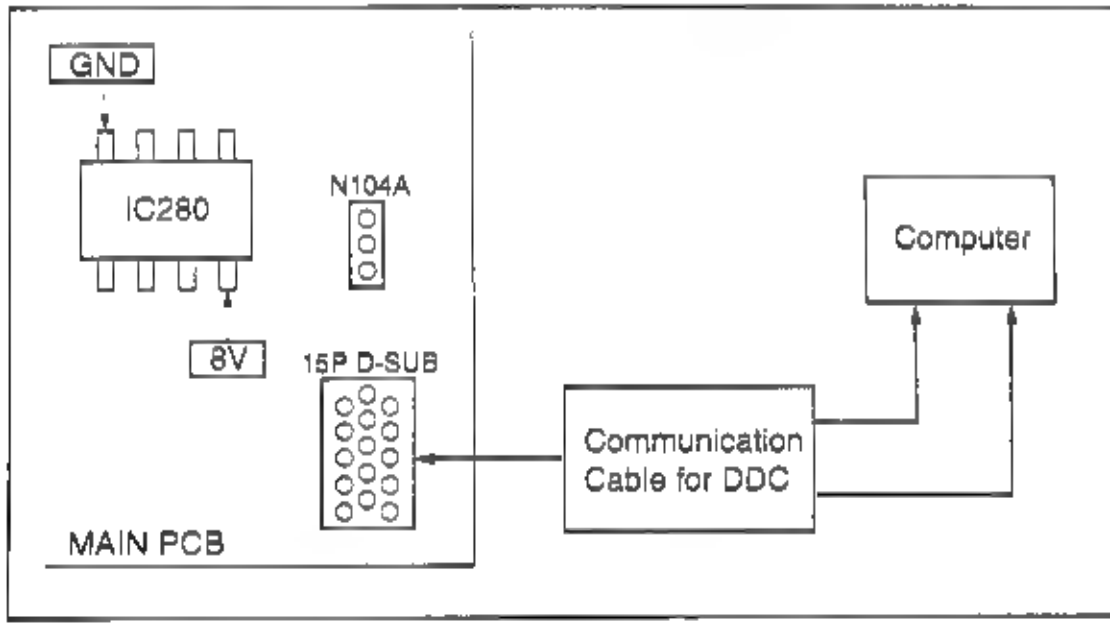


• Data Management

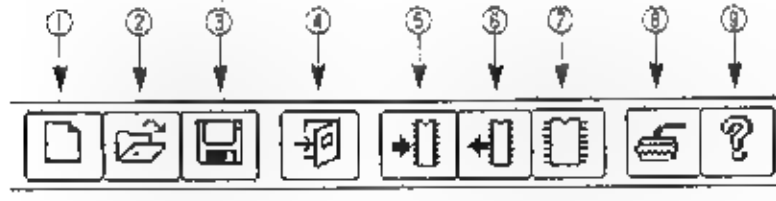
If the main PCB has been replaced, the data of the replaced PCB must be rewritten. The data rewriting procedures are as follows.

(1) Connect the communication cable for DDC to the defective PCB (15P D-SUB) and PC (9P D-SUB).
(2) Start the DDC control program.
(3) Connect the 5-V power line to IC280 (8) and GND to IC280 (4) of the defective PCB respectively.
(4) Click on ICON (6) in the window to save the data from the monitor.
(5) Click on ICON (3) to enter file names and save them on the **new disk**.
(6) Disconnect the 5-V power line and D-SUB connector from the defective PCB.
(7) Switch on the monitor whose main PCB has been replaced and connect the D-SUB **connector**.
(8) Click on ICON (2) to enter the same file names as in step (4).
(9) Click on ICON (5) to load the data into the monitor.
(10) Click on ICON (6) and confirm that the data has been rewritten.

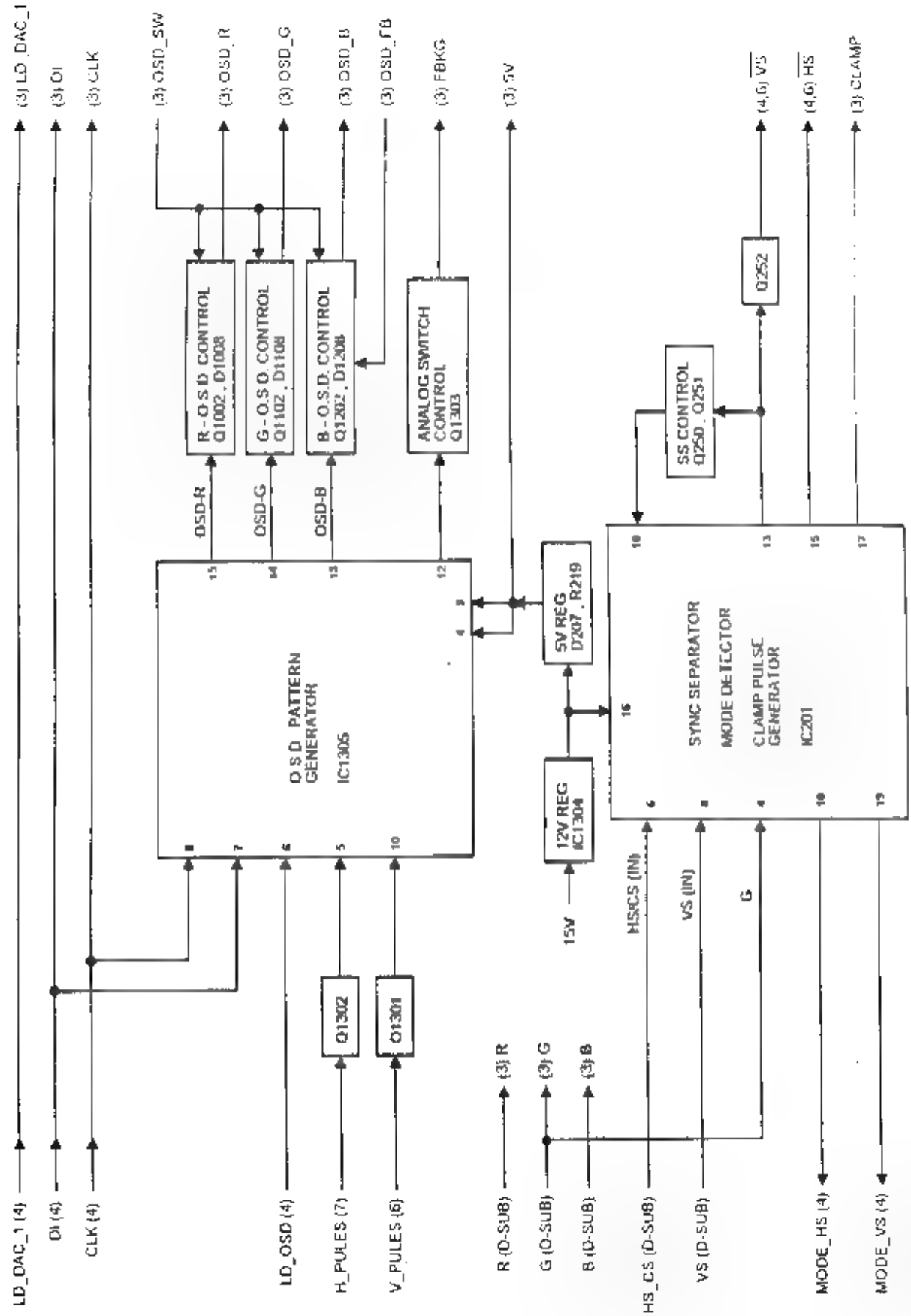
Connection Diagram



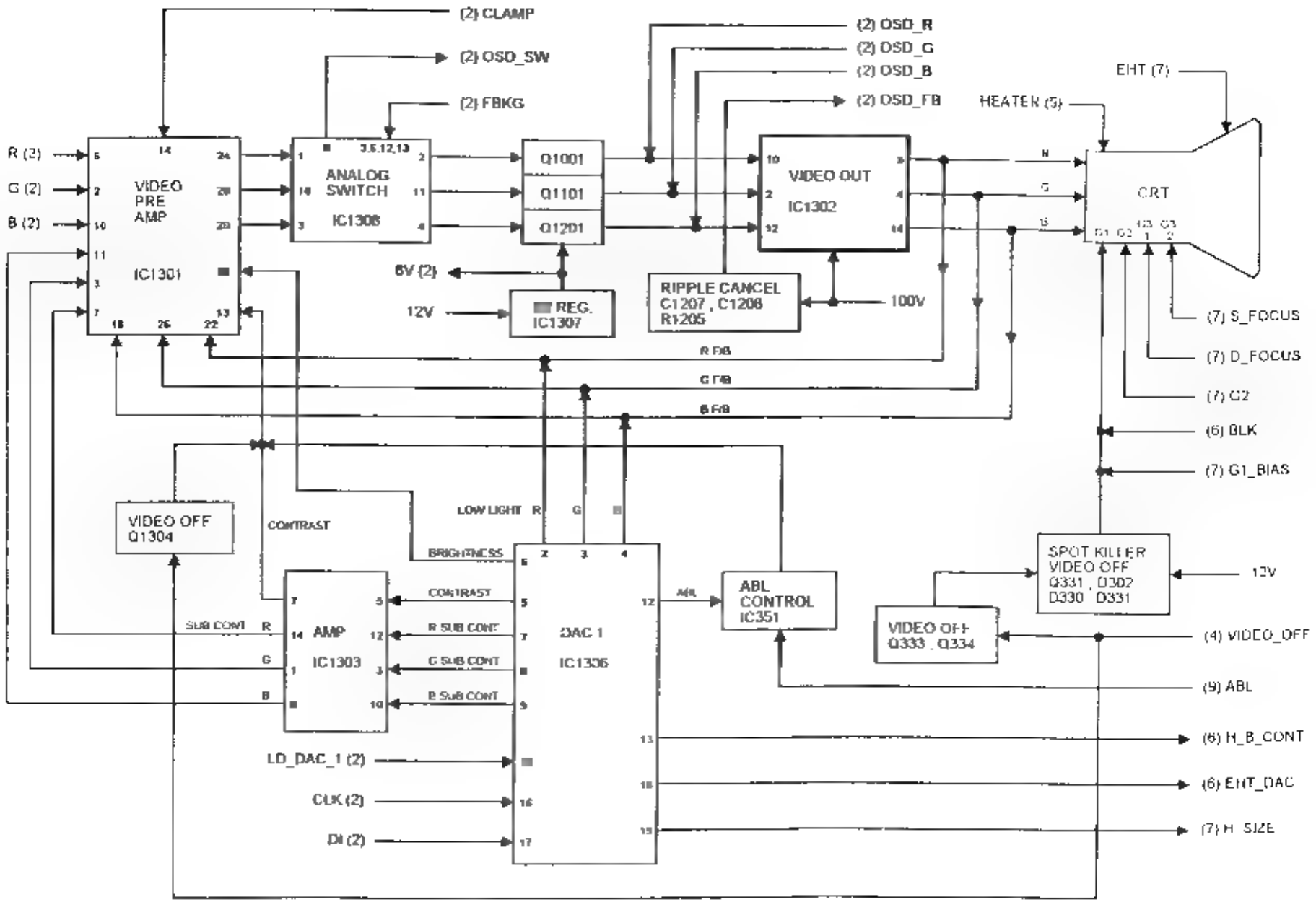
ICON



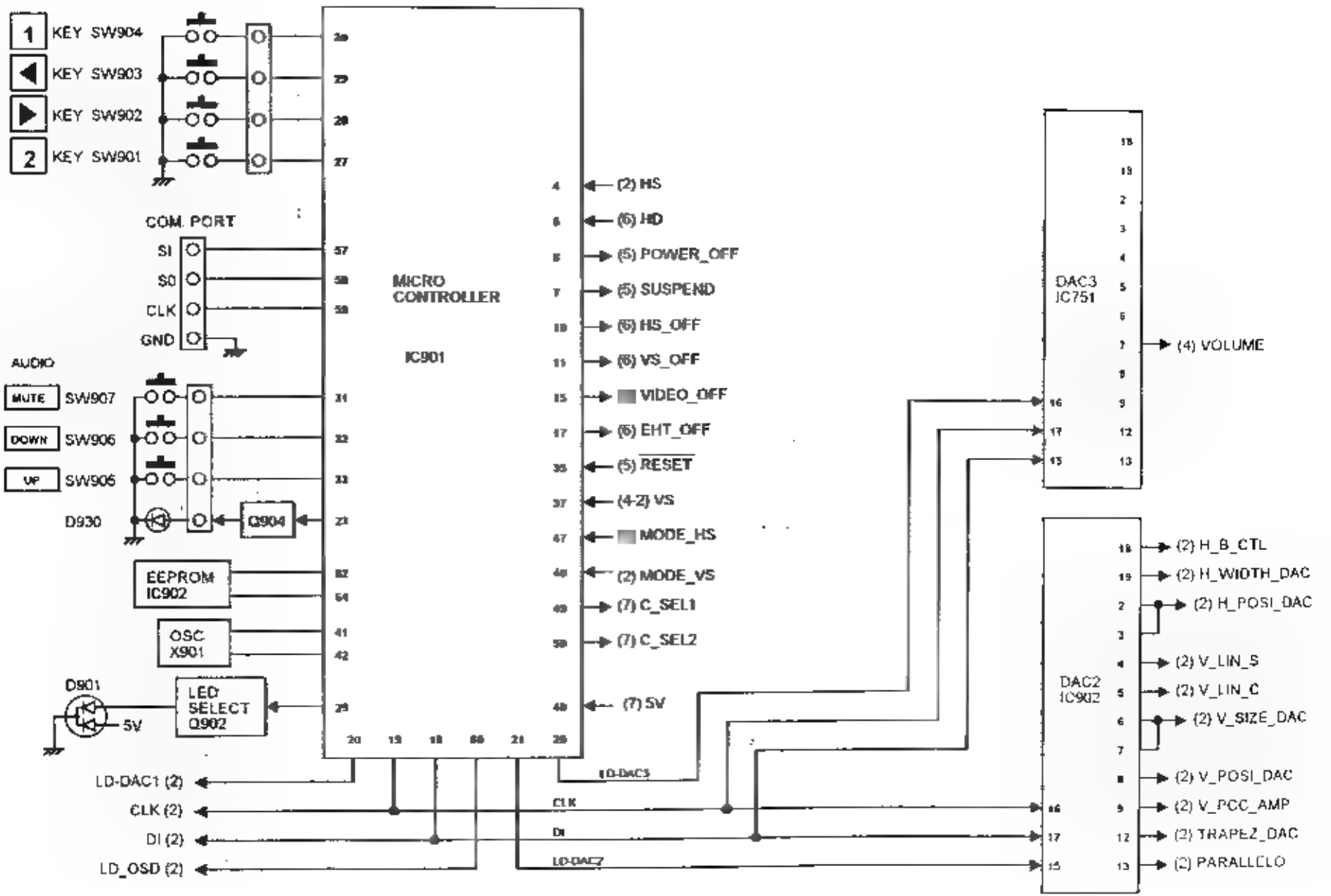
SHEET (2) / SYNC SEPARATE / O.S.D. GENERTOR



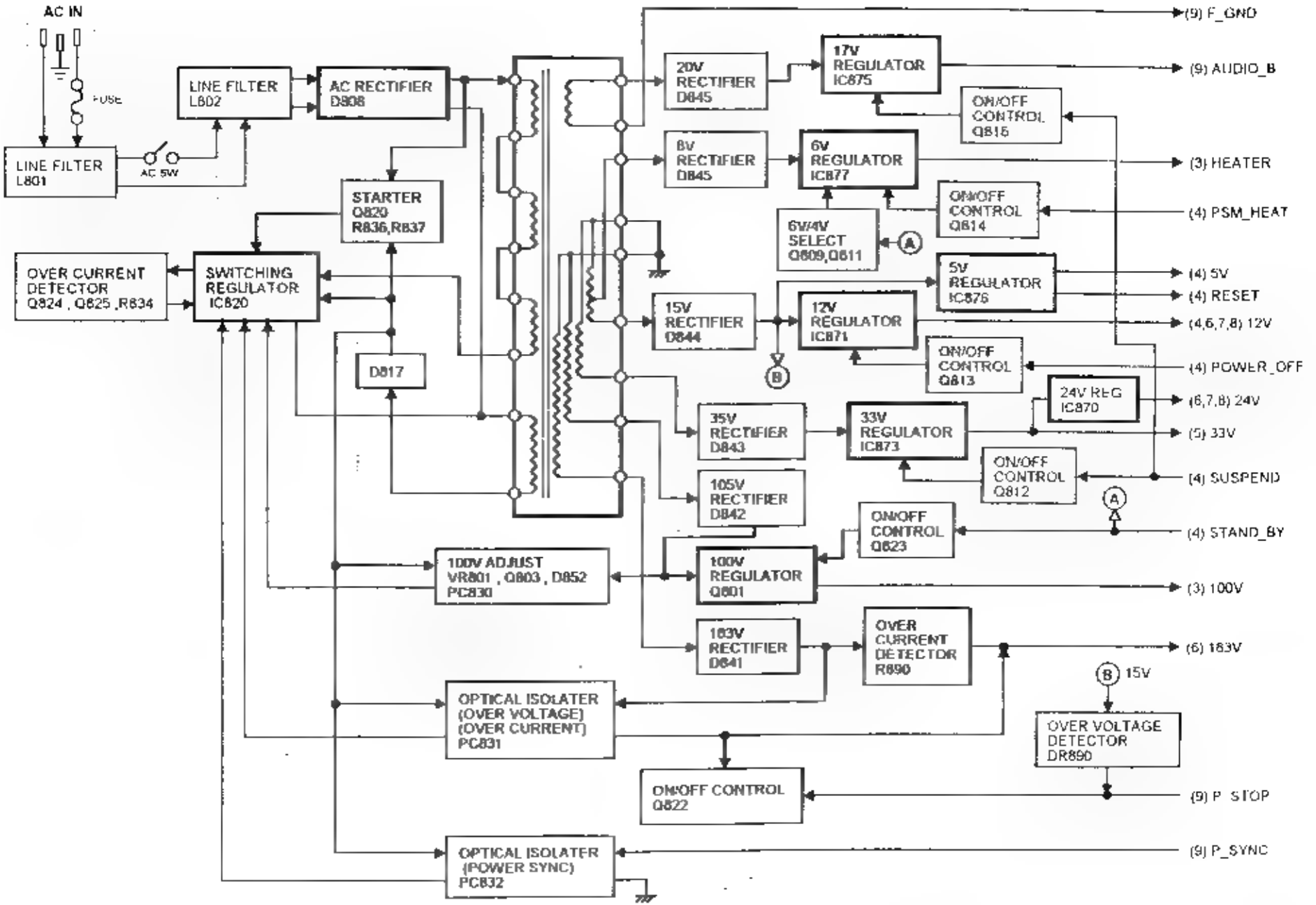
SHEET (3) / VIDEO OUT



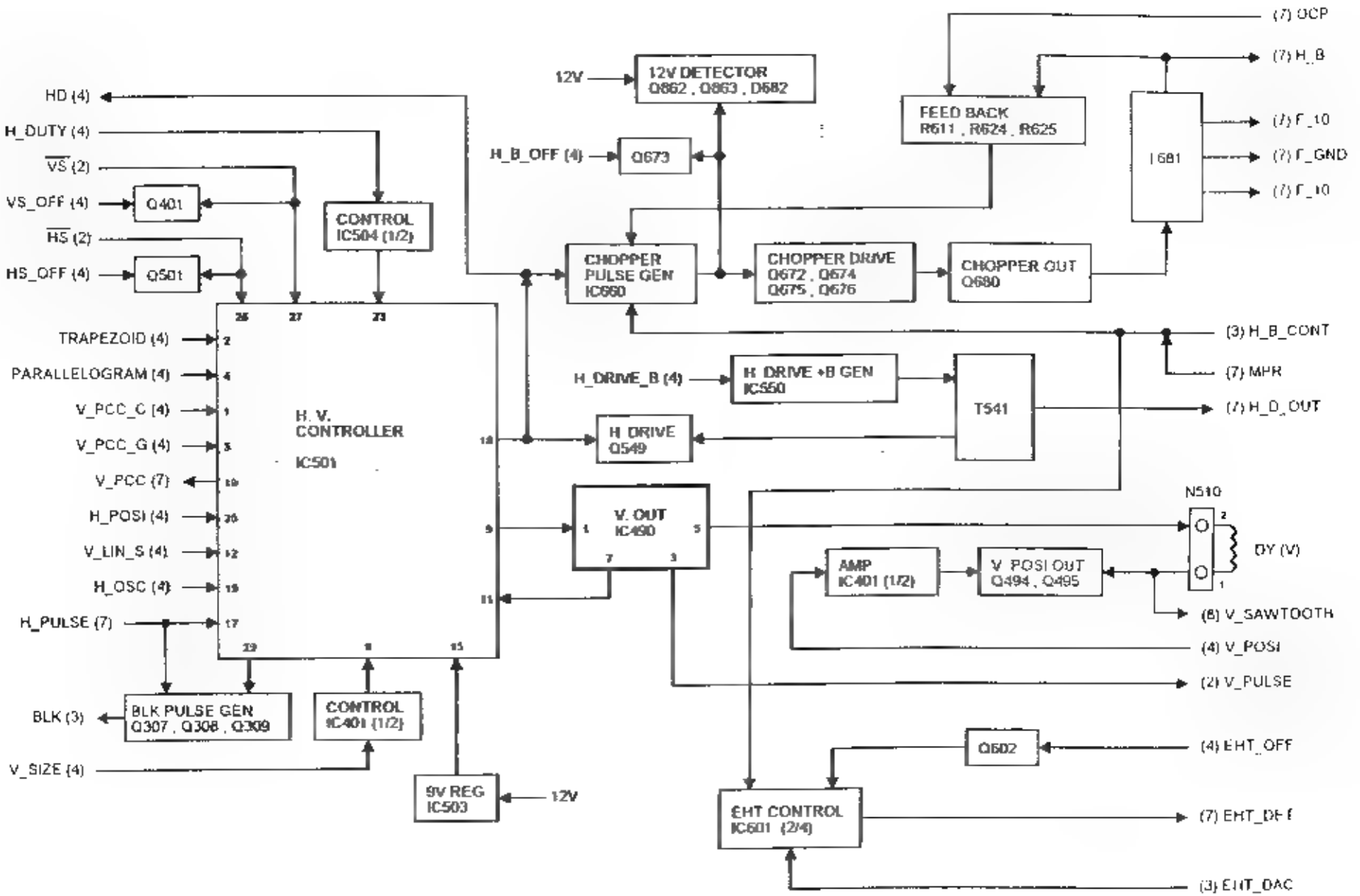
SHEET (4) / MICRO CONTROLLER / DIGITAL ANALOG CONVERTER for HV5F



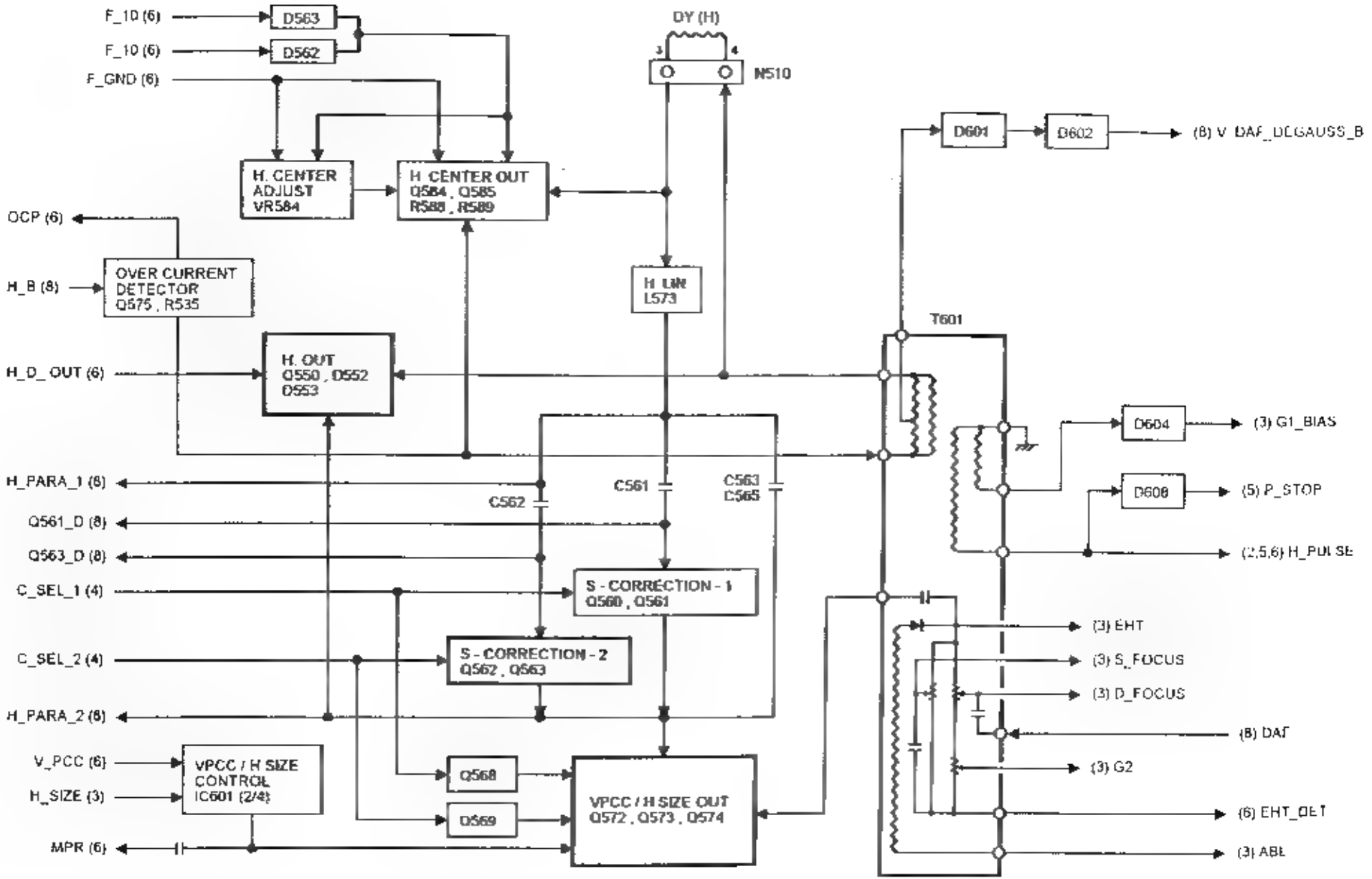
SHEET (5) / POWER SUPPLY for HV5F



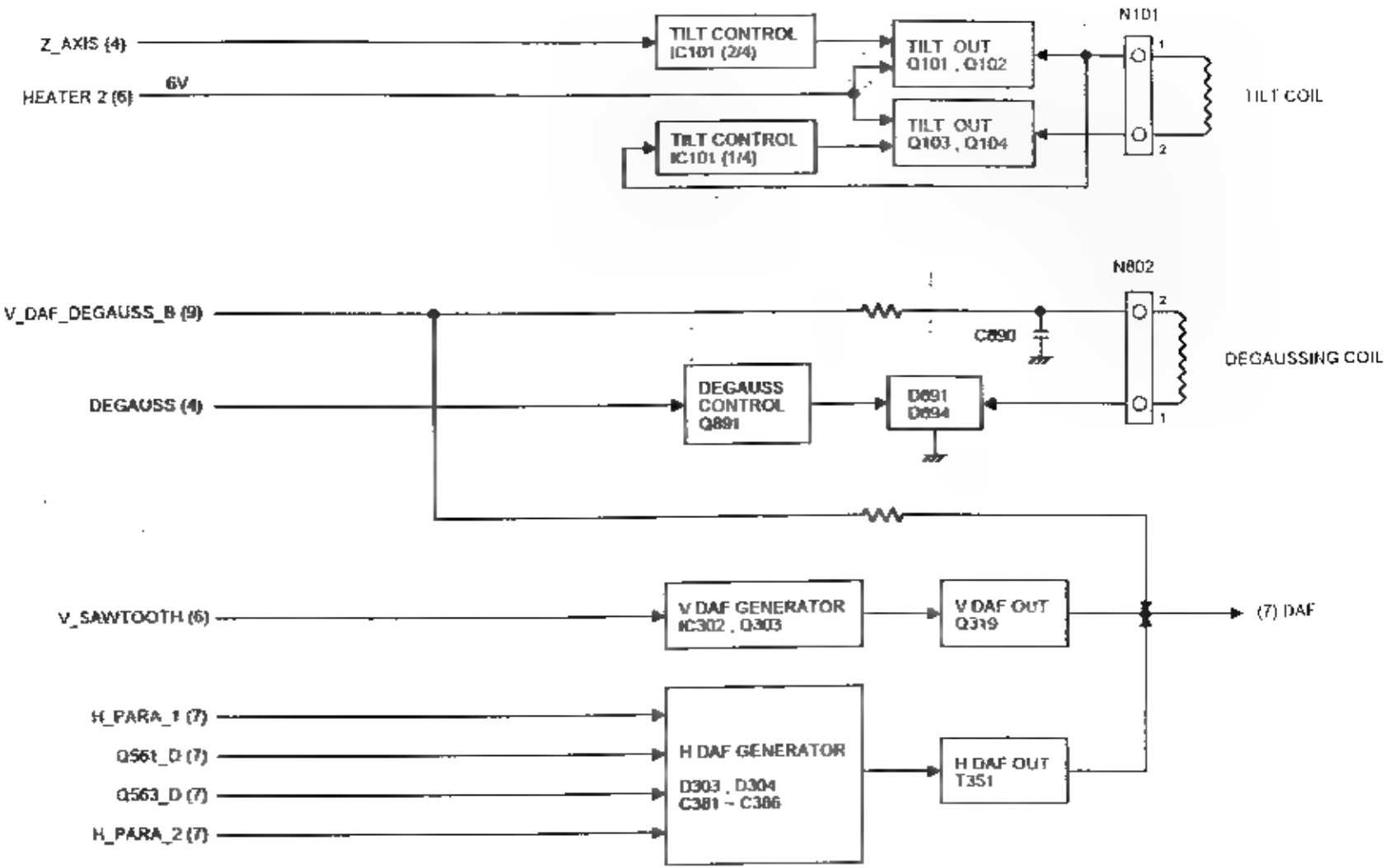
SHEET (6) / HV CONTROL / V OUT



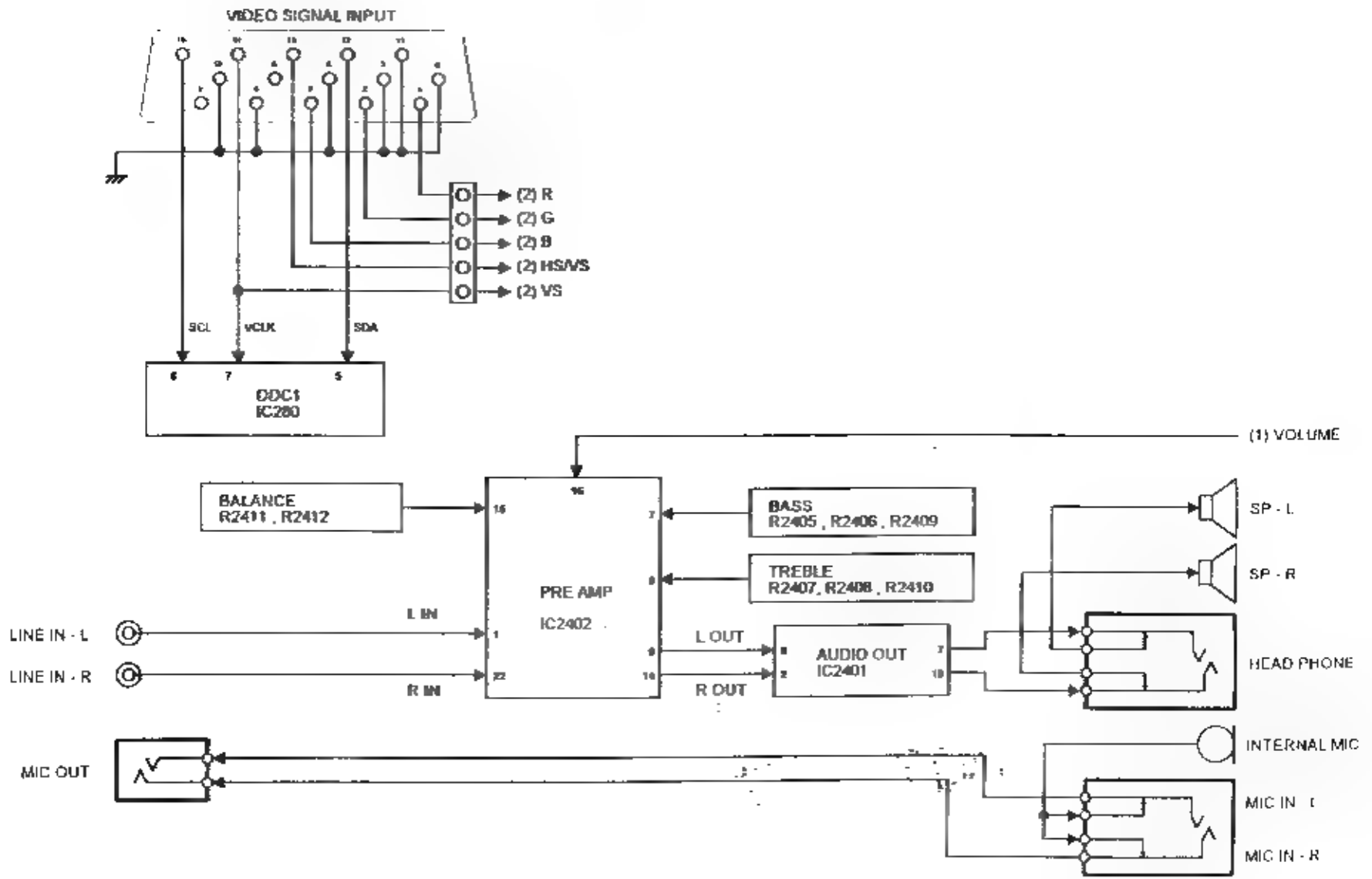
SHEET (7) / H OUT


F_10 (6)
F_10 (6)
F_GND (6)
D563
D562
DY (H)
3
4
N510
H. CENTER ADJUST VR584
H. CENTER OUT Q584 , Q585 R588 , R589
OCP (6)
H_B (8)
OVER CURRENT DETECTOR Q575 , R535
H. LIN L573
H_D_ OUT (6)
H. OUT Q550 , Q552 Q553
H_PARA_1 (8)
C562
C561
C563
C565
Q561_D (8)
Q563_D (8)
C_SEL_1 (4)
S - CORRECTION - 1 Q560 , Q561
C_SEL_2 (4)
S - CORRECTION - 2 Q562 , Q563
H_PARA_2 (8)
V_PCC (6)
H_SIZE (3)
VPCC / H SIZE CONTROL IC601 (2/4)
MPR (6)
Q568
Q569
VPCC / H SIZE OUT Q572 , Q573 , Q574
D601
D602
(8) V_DAF_DEGAUSS_B
T601
D604
(3) G1_BIAS
D608
(5) P_STOP
(2,5,6) H_PULSE
(3) EHT
(3) S_FOCUS
(3) D_FOCUS
(8) DAF
(3) G2
(6) EHT_DET
(3) ABL

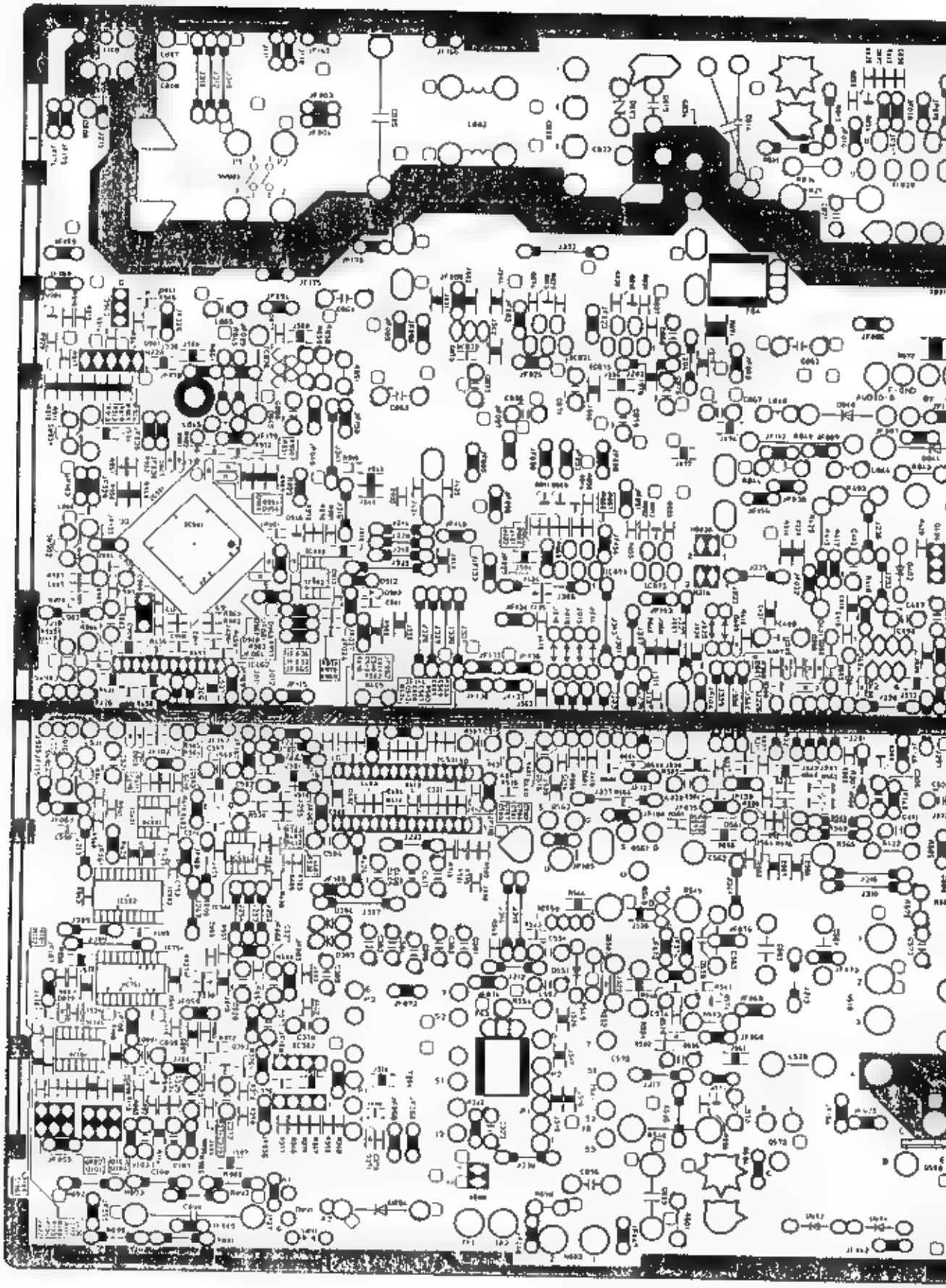
SHEET (8) / DAF OUT / DEGAUSS / TILT CONTROL



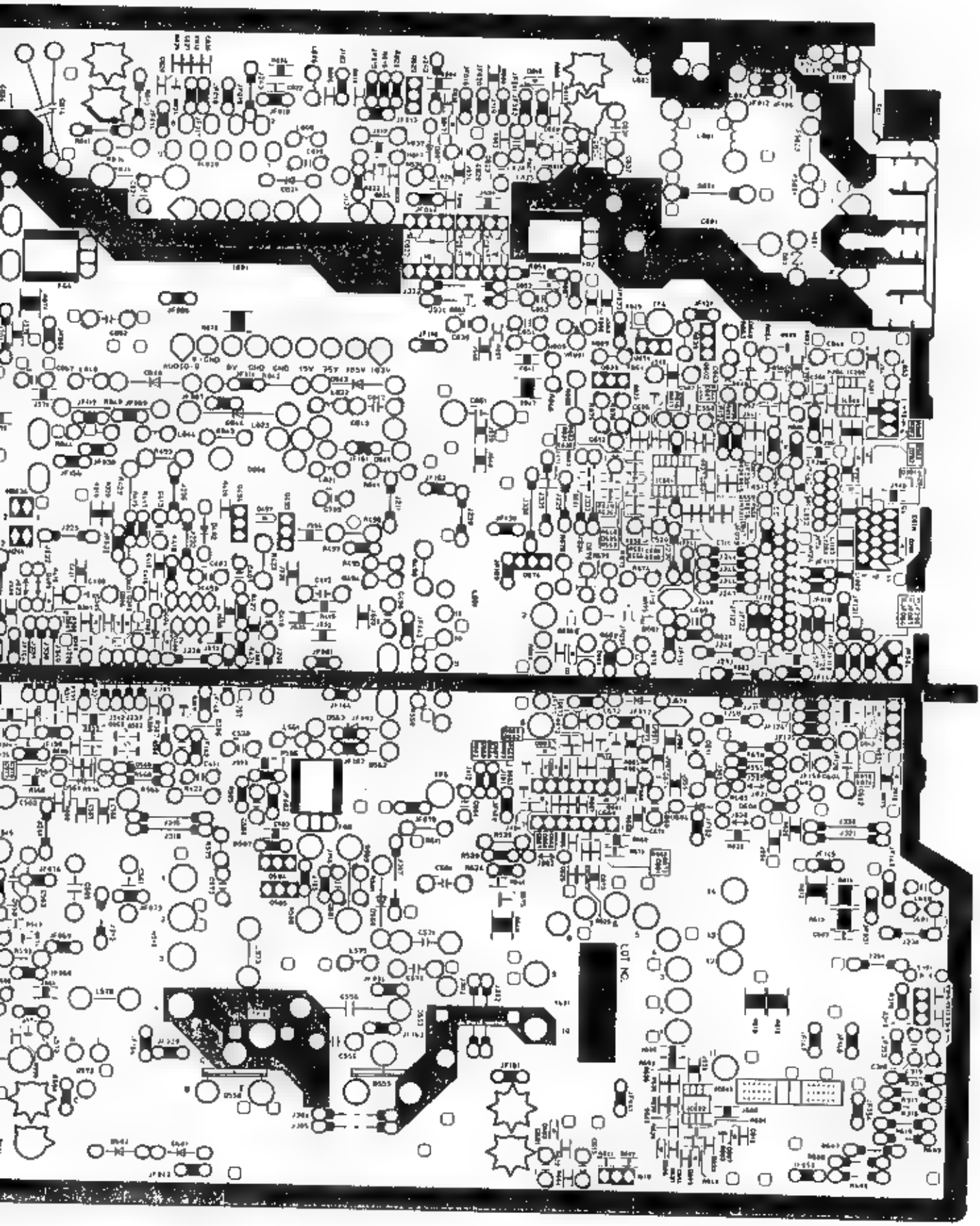
SHEET (4,10) / SIGNAL IN / AUDIO CONTROL for HV5F



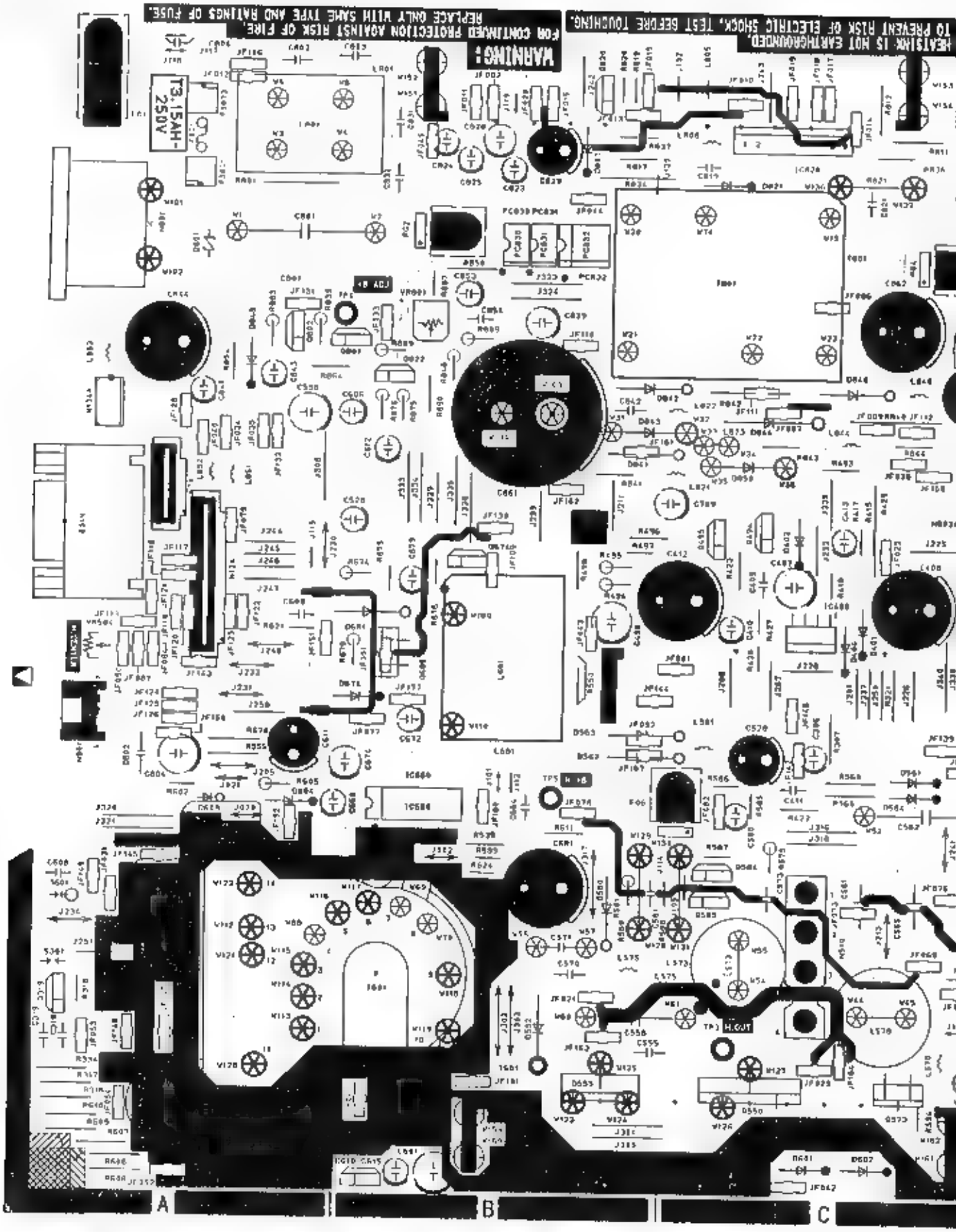
N BOARD (Solder side)



CONDUCTOR VIEW

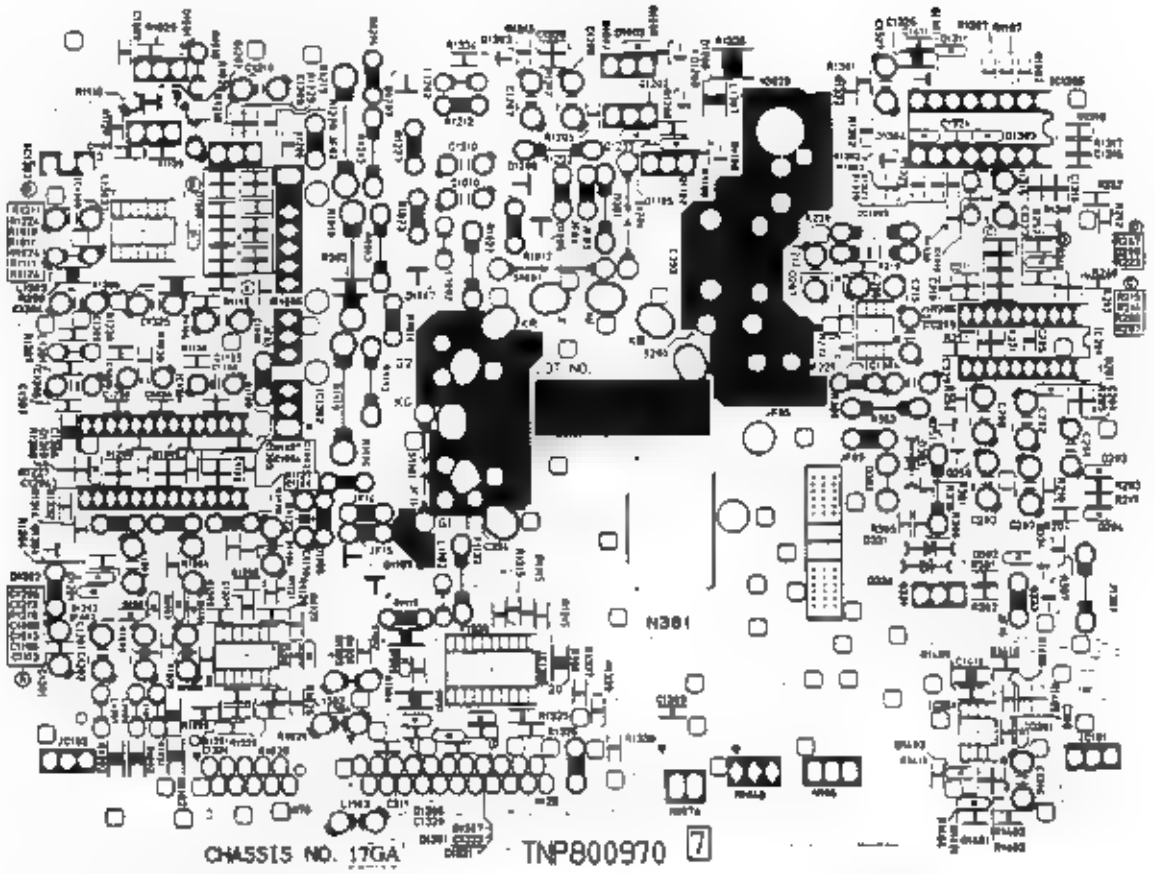


AIN BOARD (Parts side)

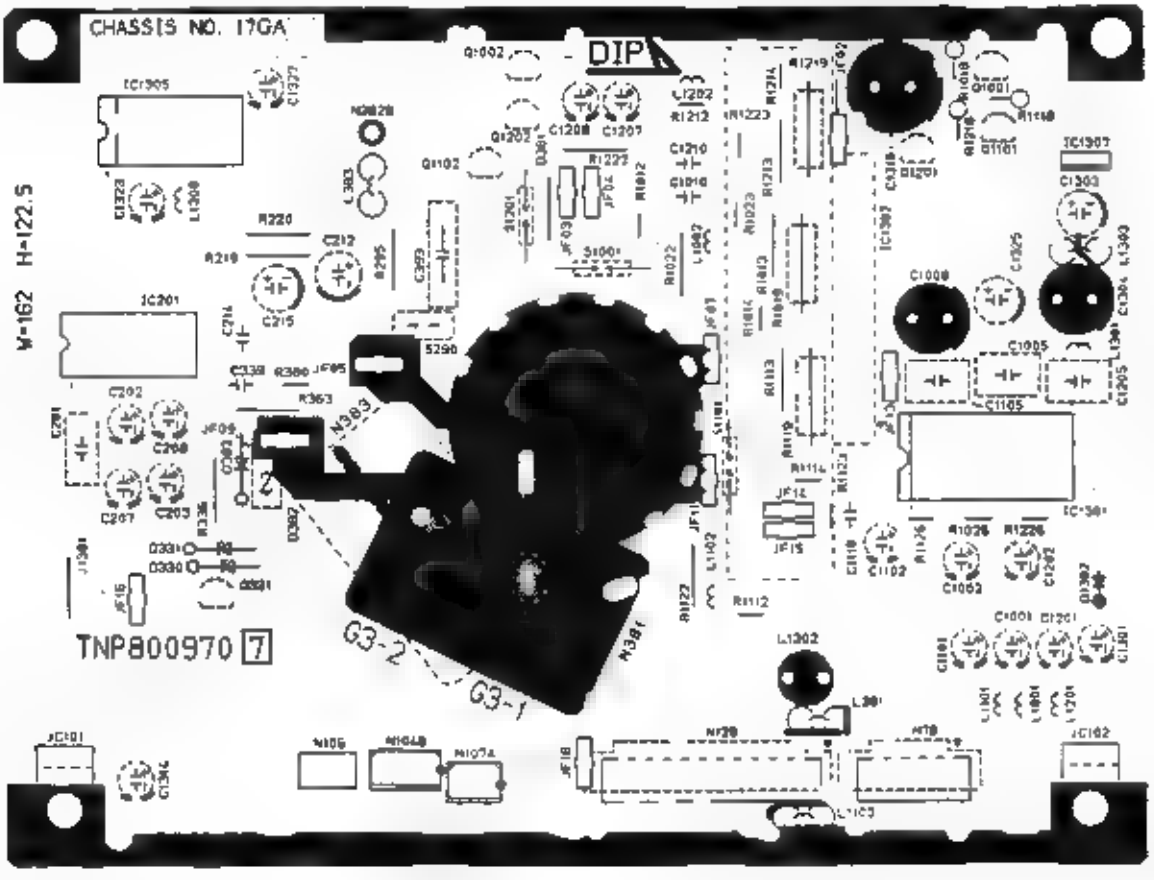


WARNING: HEATSINK IS NOT EARTHGROUNDED.
TO PREVENT RISK OF ELECTRIC SHOCK, TE
PCB SIZE
246 x 327
TNP890535 8
CHASSIS NO. 7GA
DIP
N
LED
1
2
3
4
5
C
D
E
H DRIVE 4B
H OUT

VIDEO BOARD (Solder side)



VIDEO BOARD (Parts side)



SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE

The component identified by shading or international symbol ⚠ on the following schematic diagrams incorporate special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts are used for those critical components.

NOTES :

1. RESISTOR

All resistors are carbon 1/4W resistor, unless otherwise noted by the following marks

Unit of resistance is ohm. Ω : K = 1,000, M = 1,000,000

- Non Flammable
- Metal Oxide
- Wire Wound
- Fusible
- Flame Proof Rectangular
- Solid
- Metal (Precision and high stability)
- Thermistor
- Positive coefficient Thermistor

2. CAPACITOR

All capacitors are ceramic 50V capacitor, unless otherwise noted by the following marks

Unit of capacitance is μF, unless otherwise noted

- Electrolytic
- Tantalum
- Bipolar
- Polystyrene
- Temperature Compensation
- Polyester
- Metalized Polyester
- Polypropylene
- Mica
- Ceramic
- Ceramic (SL)

3. COIL

Unit of inductance is μH, unless otherwise noted

4. VOLTAGE MEASUREMENT

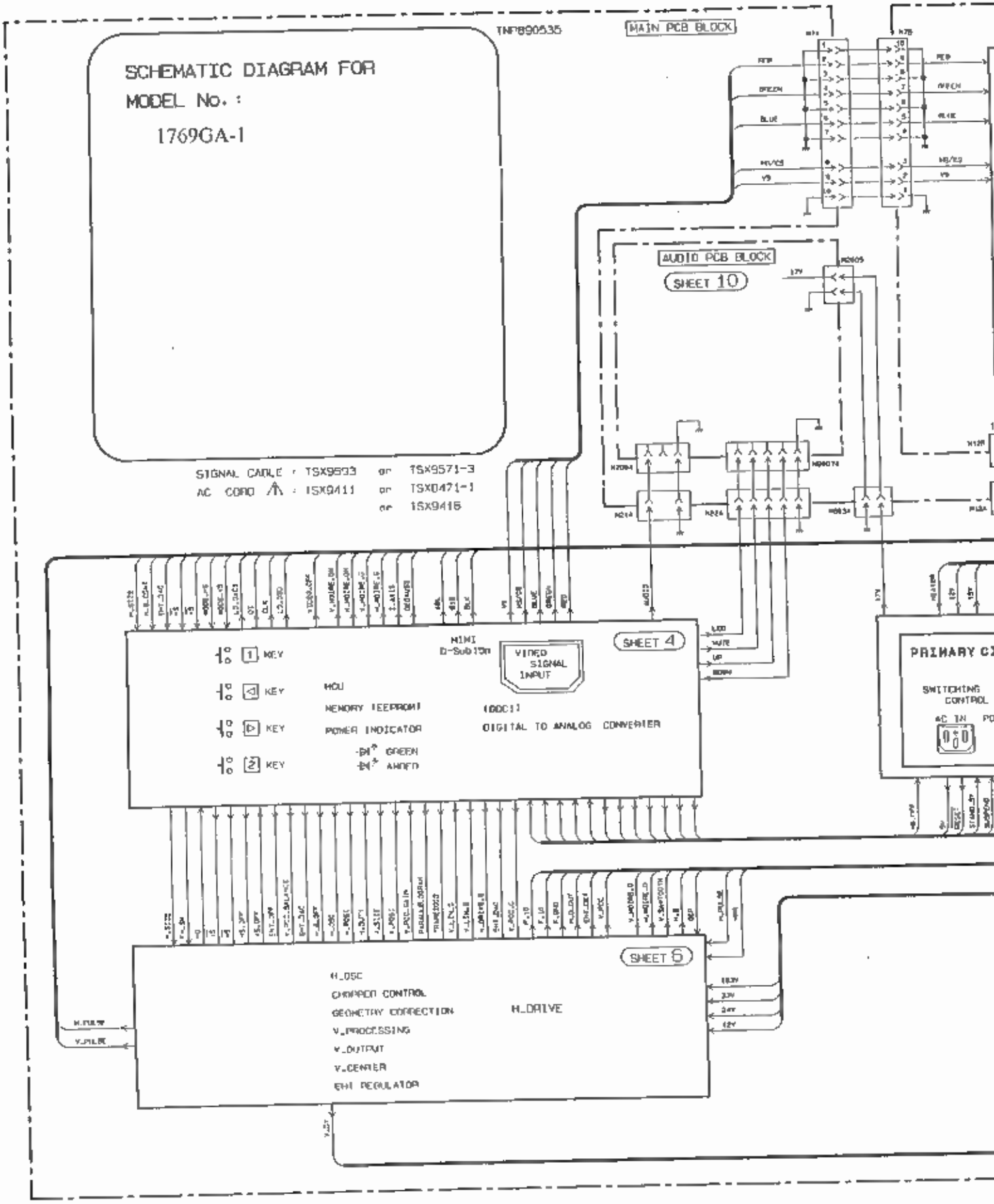
Voltage is measured by a digital meter receiving normal signal

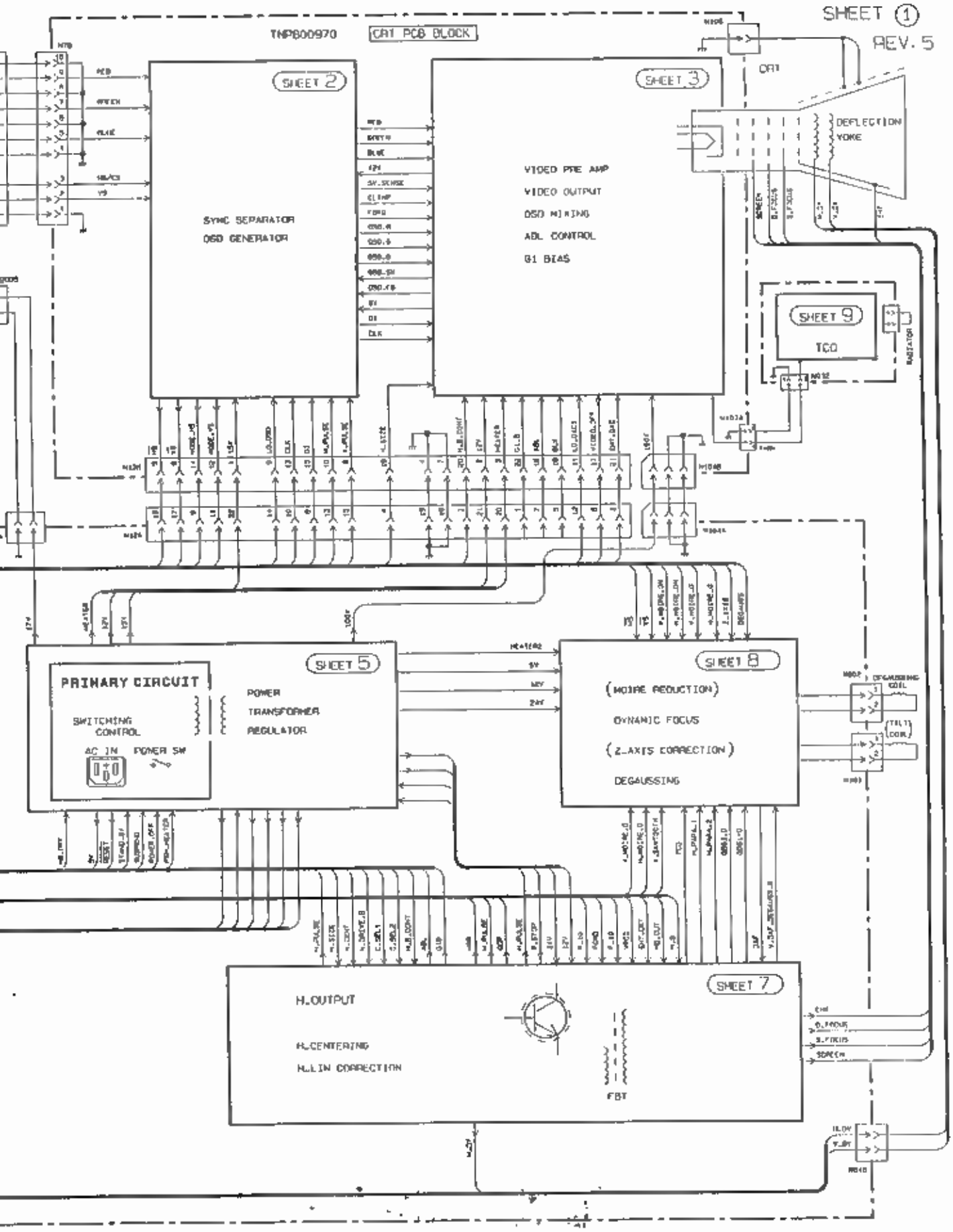
5. This schematic diagram is the latest at the time of printing and is subject to change without notice

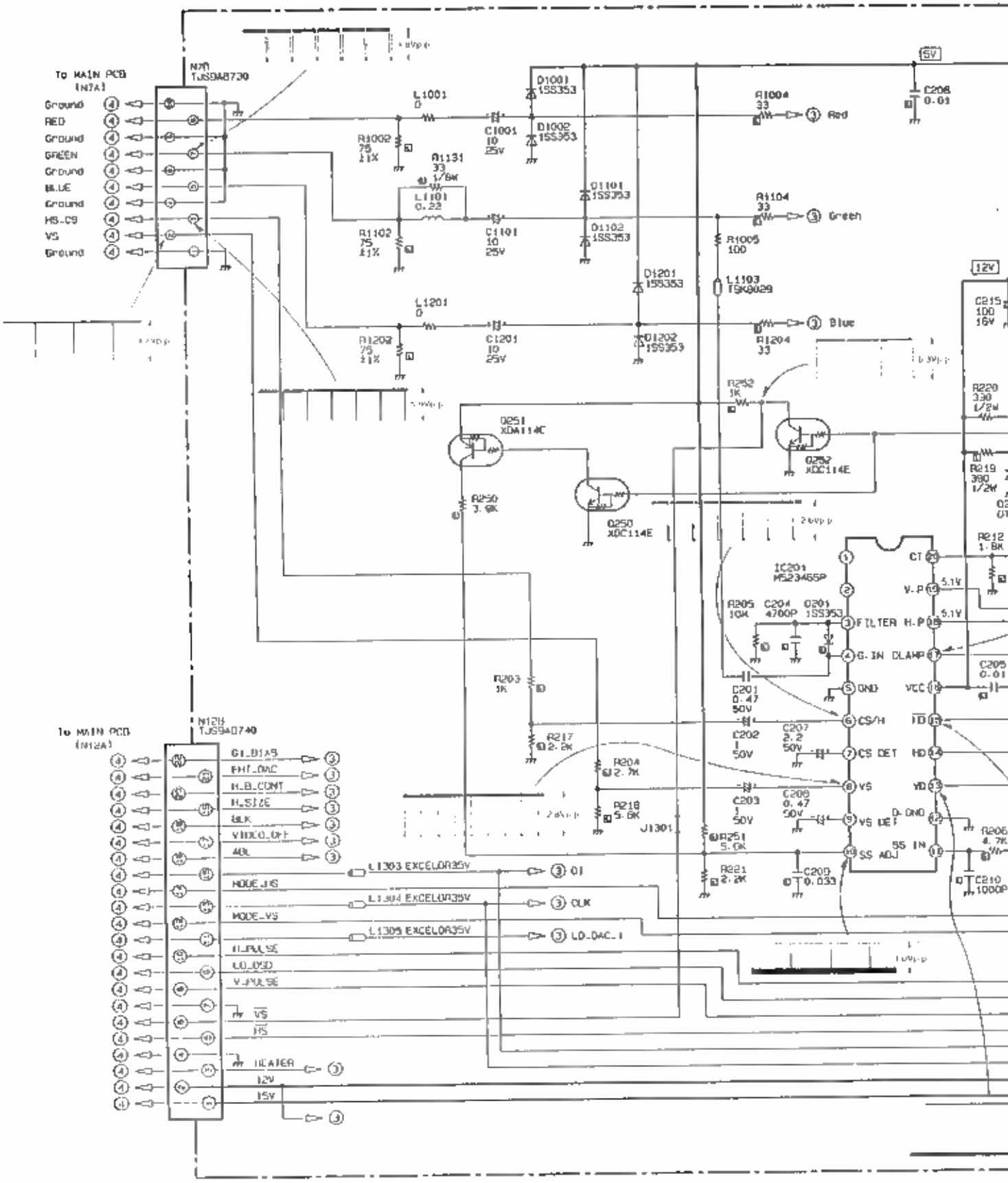
SERVICE NOTES :

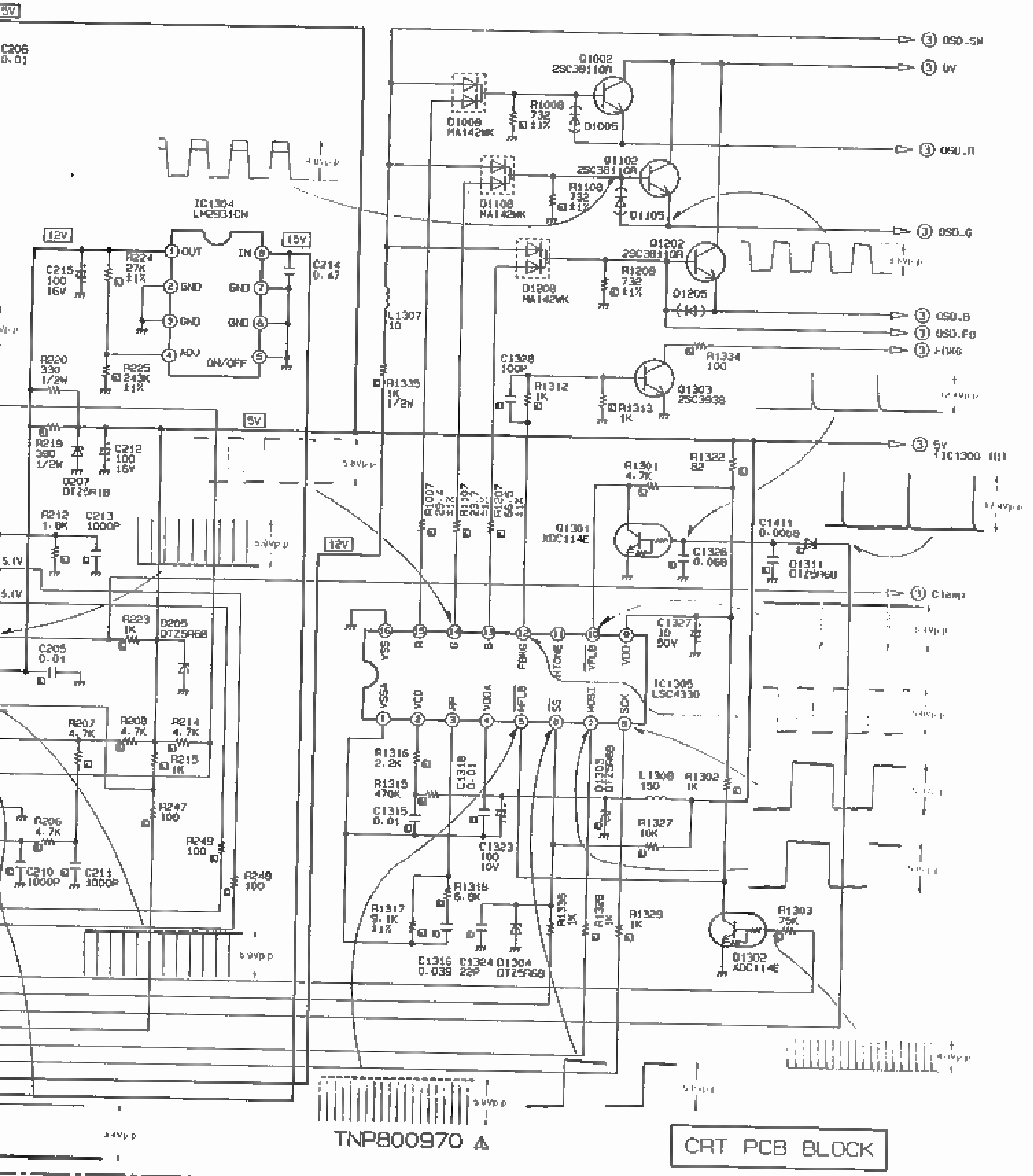
This model has a section that does not share a common ground with the power supply section. The different sections are referred to as the HOT section and the COLD section in the precautions below

1. Do not touch the HOT section and the COLD section at the same time. You may **suffer an electric shock.**
2. Do not short the HOT section to the COLD section. This could blow the fuse or damage parts
3. Never measure the HOT section and the COLD section at the same time when using tools such as oscilloscopes or multimeters
4. Always unplug the unit before beginning any **operations, such as removing the chassis.**


SCHEMATIC DIAGRAM FOR
MODEL No. :
1769GA-1
TNP890535
MAIN PCB BLOCK
AUDIO PCB BLOCK
SHEET 10
SIGNAL CABLE : TSX9593 or TSX9571-3
AC CORD : TSX9411 or TSX0471-1
or TSX9416
SHEET 4
MINI D-Sub15p
VIDEO SIGNAL INPUT
1 KEY
KEY
KEY
KEY
MCU
MEMORY (EEPROM)
POWER INDICATOR
GREEN
AMBER
(OSD)
DIGITAL TO ANALOG CONVERTER
PRIMARY
SWITCHING CONTROL
AC IN
SHEET 6
H_OSC
CHROMA CONTROL
GEOMETRY CORRECTION
V_PROCESSING
V_OUTPUT
V_CENTER
EHT REGULATOR
H_DRIVE

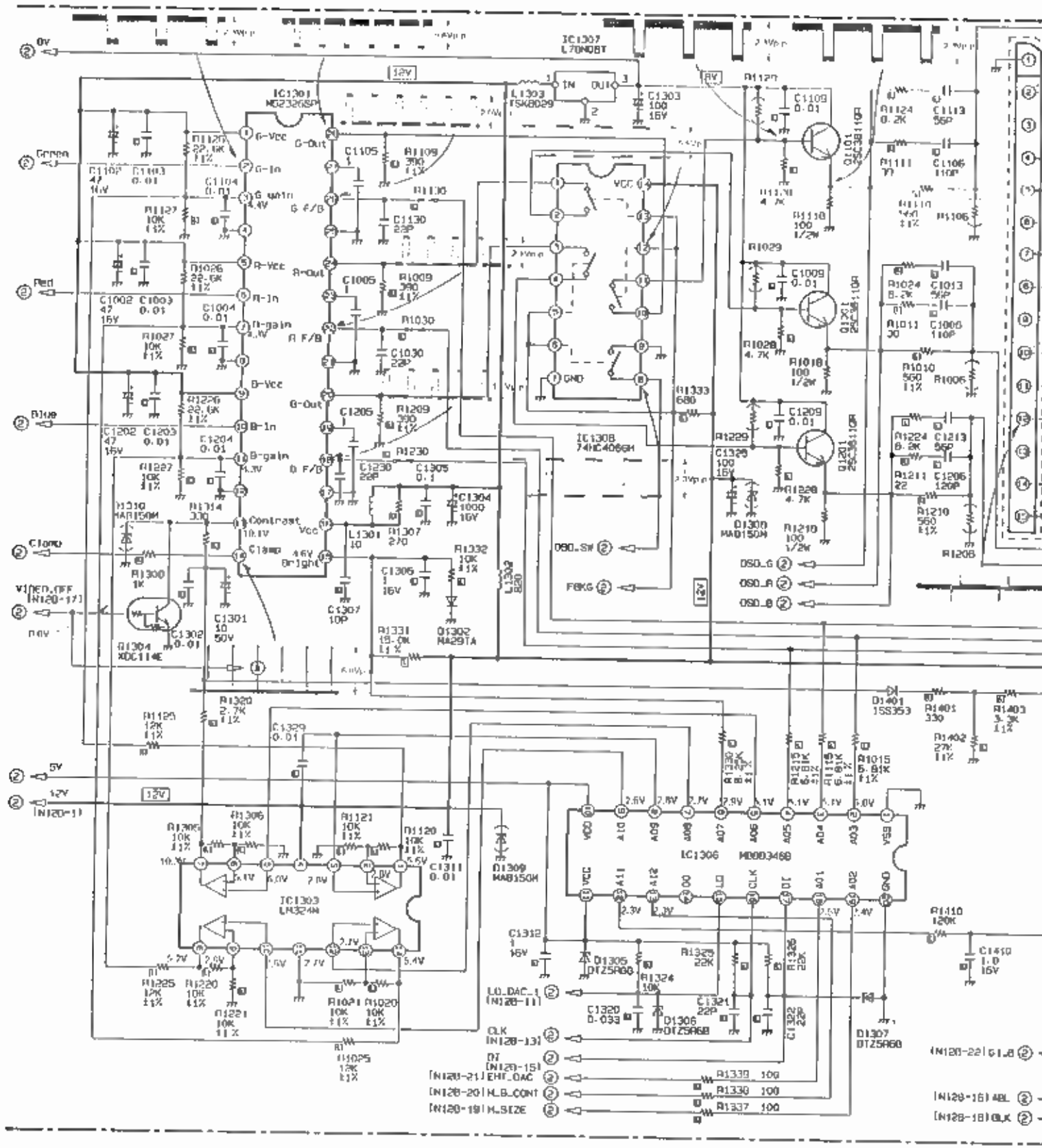

SHEET 1
REV. 5
TNP800970
CRT PCB BLOCK
SHEET 2
SYNC SEPARATOR
OSD GENERATOR
SHEET 3
VIDEO PRE AMP
VIDEO OUTPUT
OSD MIXING
ABL CONTROL
G1 BIAS
CRT
DEFLECTION YOKE
SHEET 9
TCO
SHEET 5
PRIMARY CIRCUIT
SWITCHING CONTROL
AC IN
POWER SW
POWER TRANSFORMER REGULATOR
SHEET 8
(MOIRE REDUCTION)
DYNAMIC FOCUS
(Z-AXIS CORRECTION)
DEGAUSSING
SHEET 7
H.OUTPUT
H.CENTERING
H.LIN CORRECTION
FBT

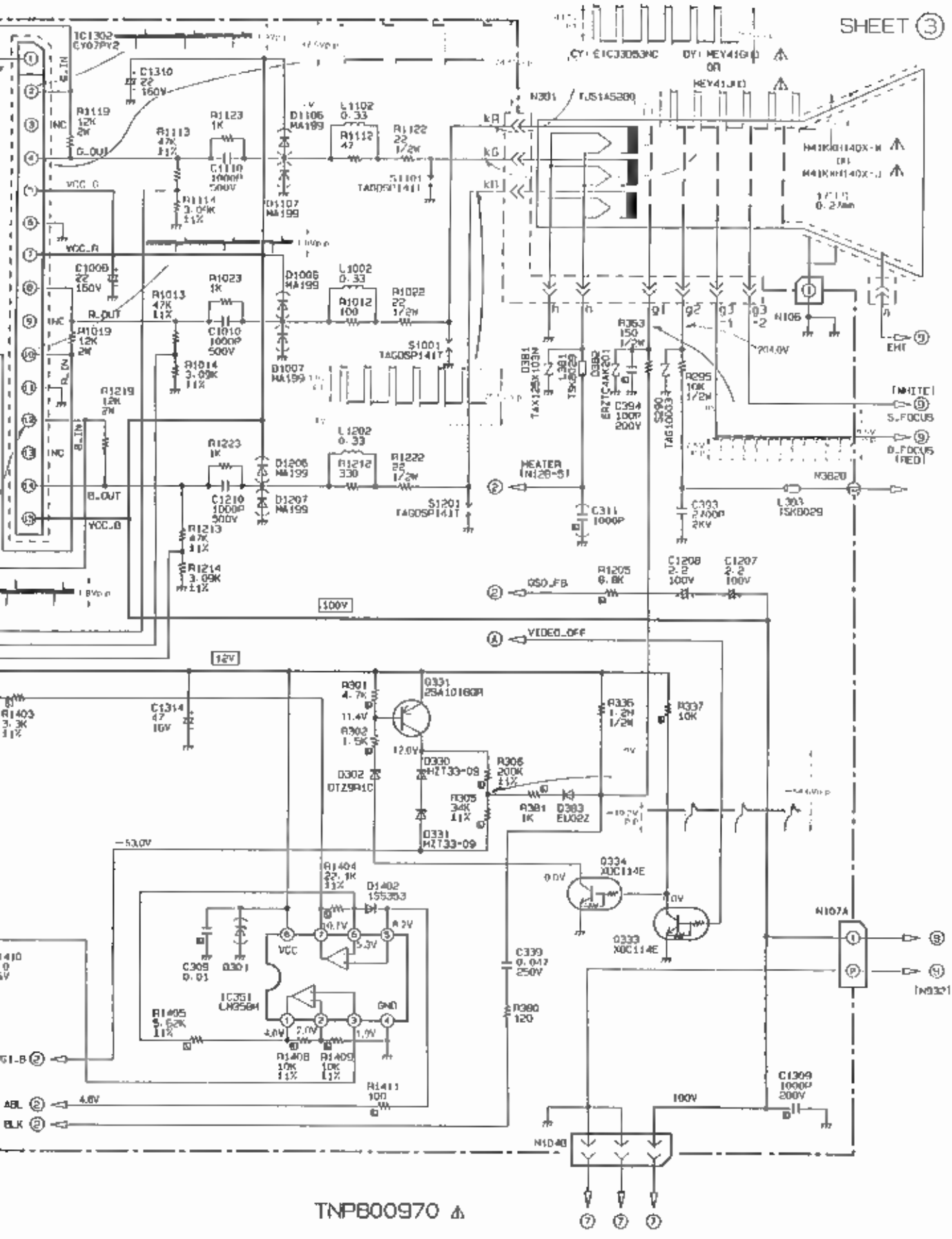

To MAIN PCB (N7A)
N7A TJS9A8730
Ground
RED
Ground
GREEN
Ground
BLUE
Ground
HS-CS
VS
Ground
L1001
0
D1001 1SS353
D1002 1SS353
C1001 10 25V
R1002 75 ±1%
R1131 33 1/8W
L1101 0.22
D1101 1SS353
D1102 1SS353
C1101 10 25V
R1102 75 ±1%
L1201
0
R1202 75 ±1%
C1201 10 25V
D1201 1SS353
D1202 1SS353
R1004 33
Red
R1104 33
Green
R1005 100
L1103 TSK9029
Blue
R1204 33
C206 0.01
15V
12V
C215 100 16V
R220 330 1/2W
R219 390 1/2W
R212 1.8K
C205 0.01
R252 1K
Q251 XDA114C
Q252 XDC114E
R250 3.9K
Q250 XDC114E
IC201 M52346SP
CT
V.P
5.1V
FILTER
H.P
5.1V
G-IN
CLAMP
GND
VCC
CS/H
HD
CS DET
VS
VD
VS DET
D-GND
SS ADJ
SS IN
R205 10K
C204 4700P
D201 1SS353
C201 0.47 50V
C202 1 50V
C207 2.2 50V
C203 1 50V
C208 0.47 50V
C209 0.033
C210 1000P
R206 4.7K
R203 1K
R217 2.2K
R204 2.7K
R218 5.6K
R251 5.6K
R221 2.2K
J1301
To MAIN PCB (N12A)
N12A TJS9A0740
G1_DIAS
PHT_DAC
H_B_CONT
H_SIZE
BLK
VIDEO_OFF
ABL
L1303 EXCELOR35V
01
MODE_HS
L1304 EXCELOR35V
CLK
MODE_VS
L1305 EXCELOR35V
LD_DAC_1
H_PULSE
LD_DSD
V_PULSE
VS
HS
HEATER
12V
15V

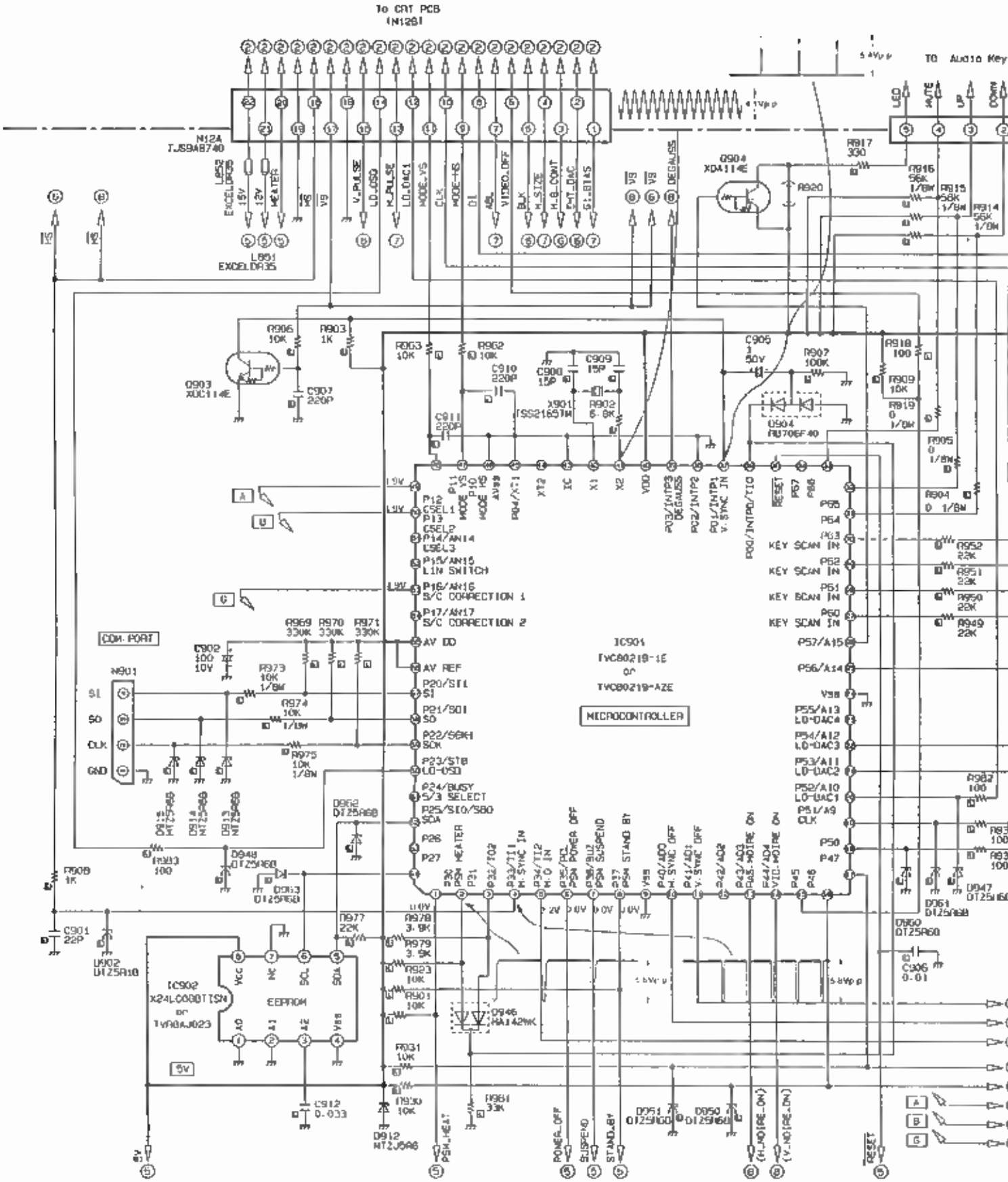


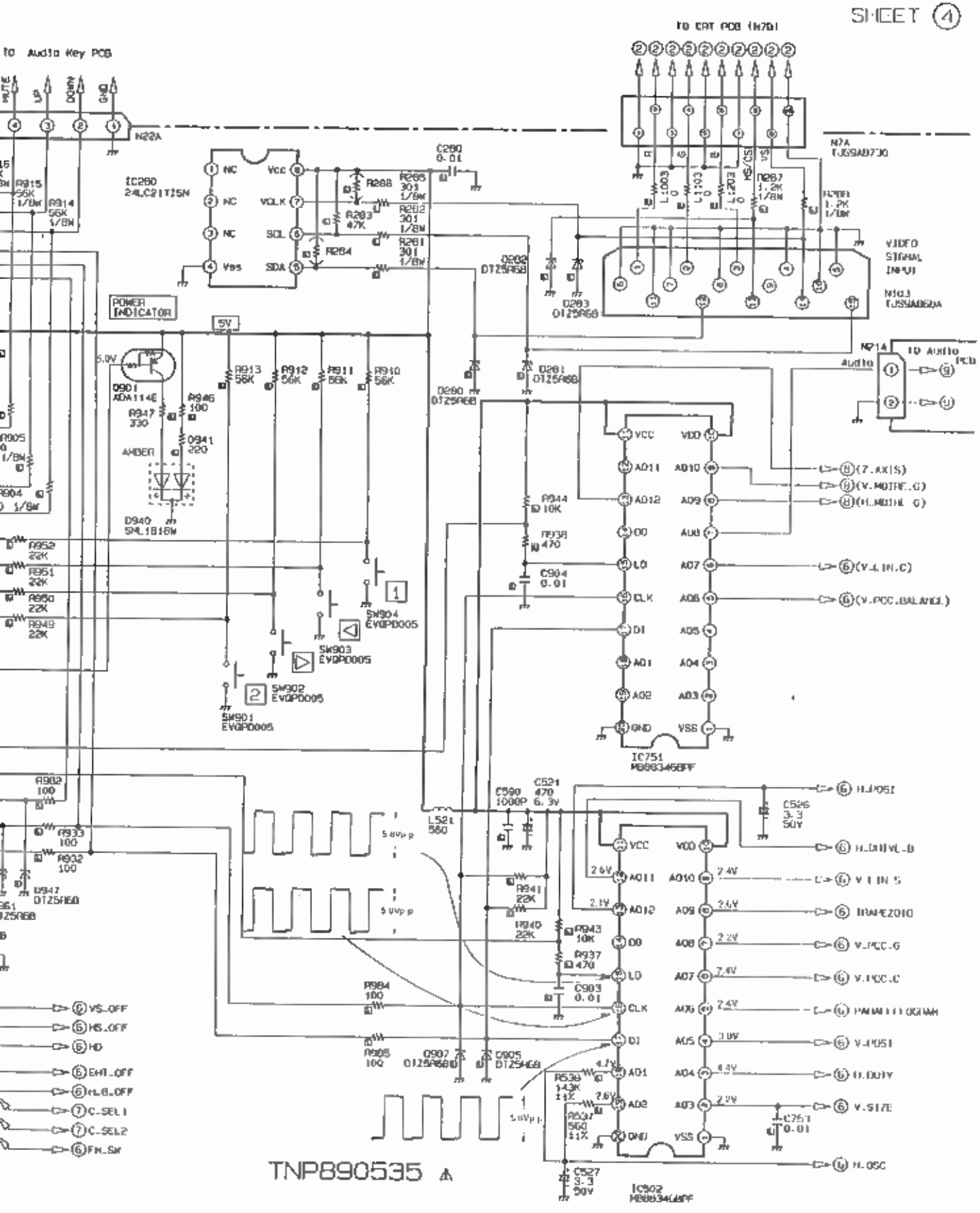
TNP800970 ⚠

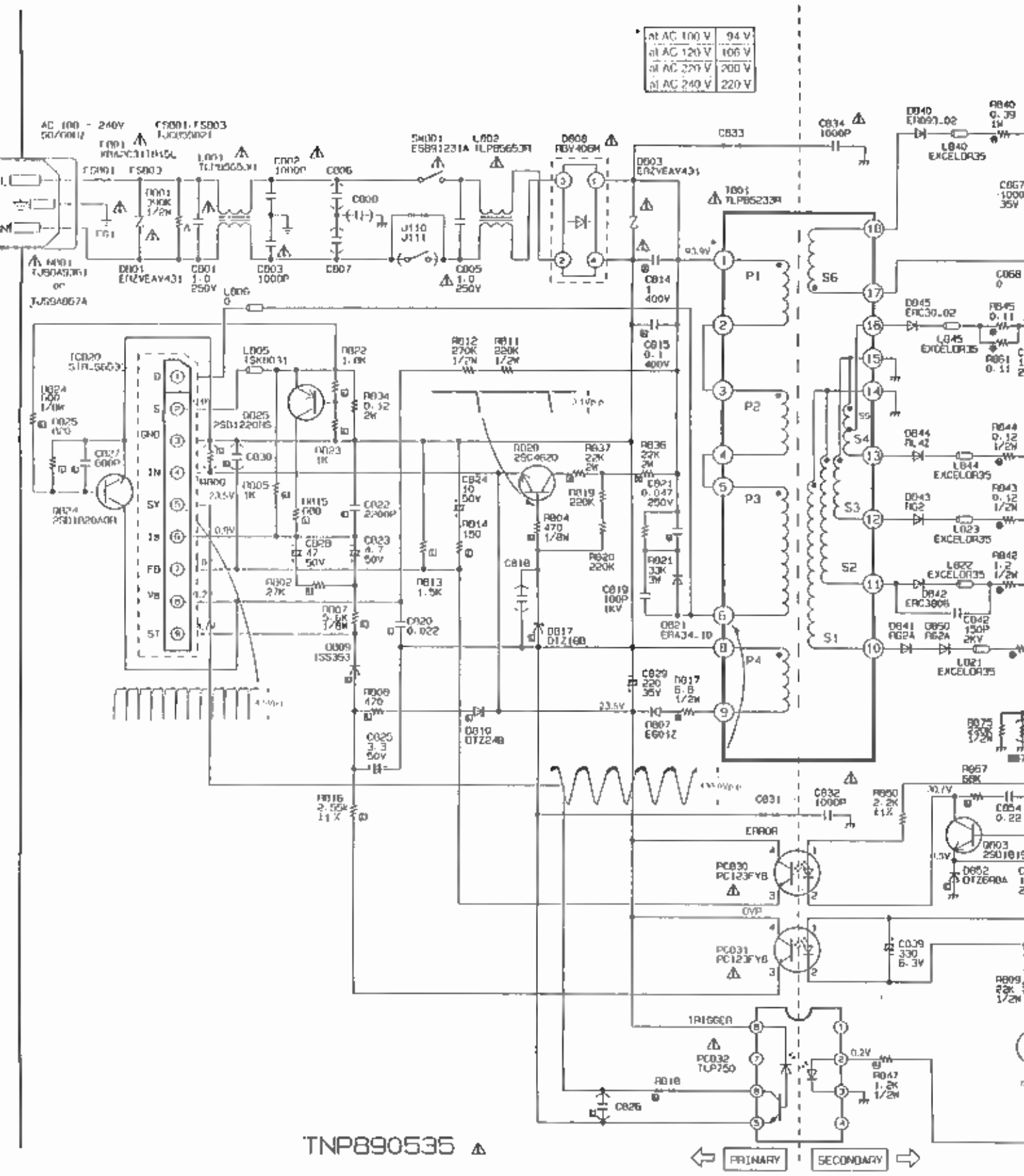
CRT PCB BLOCK

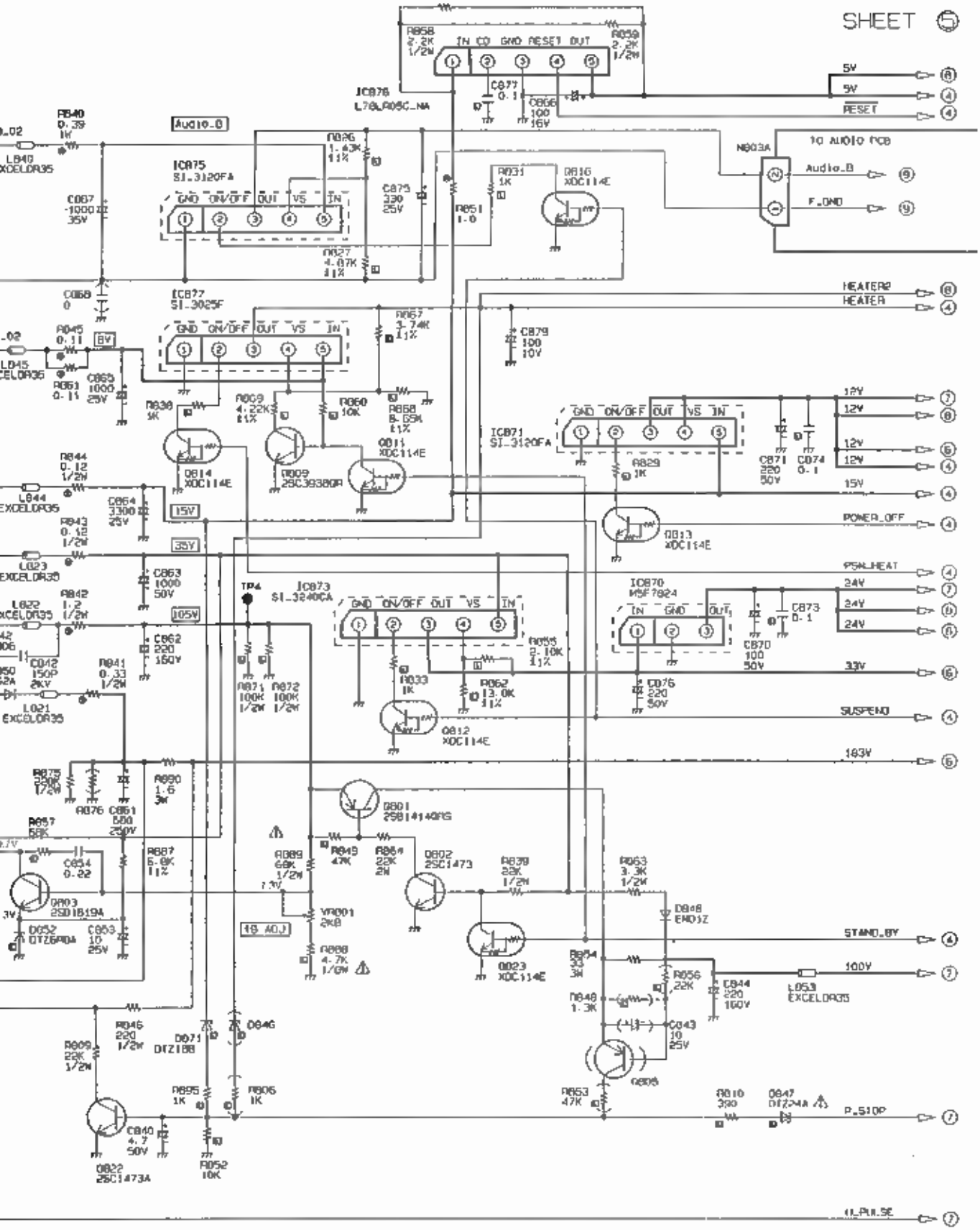


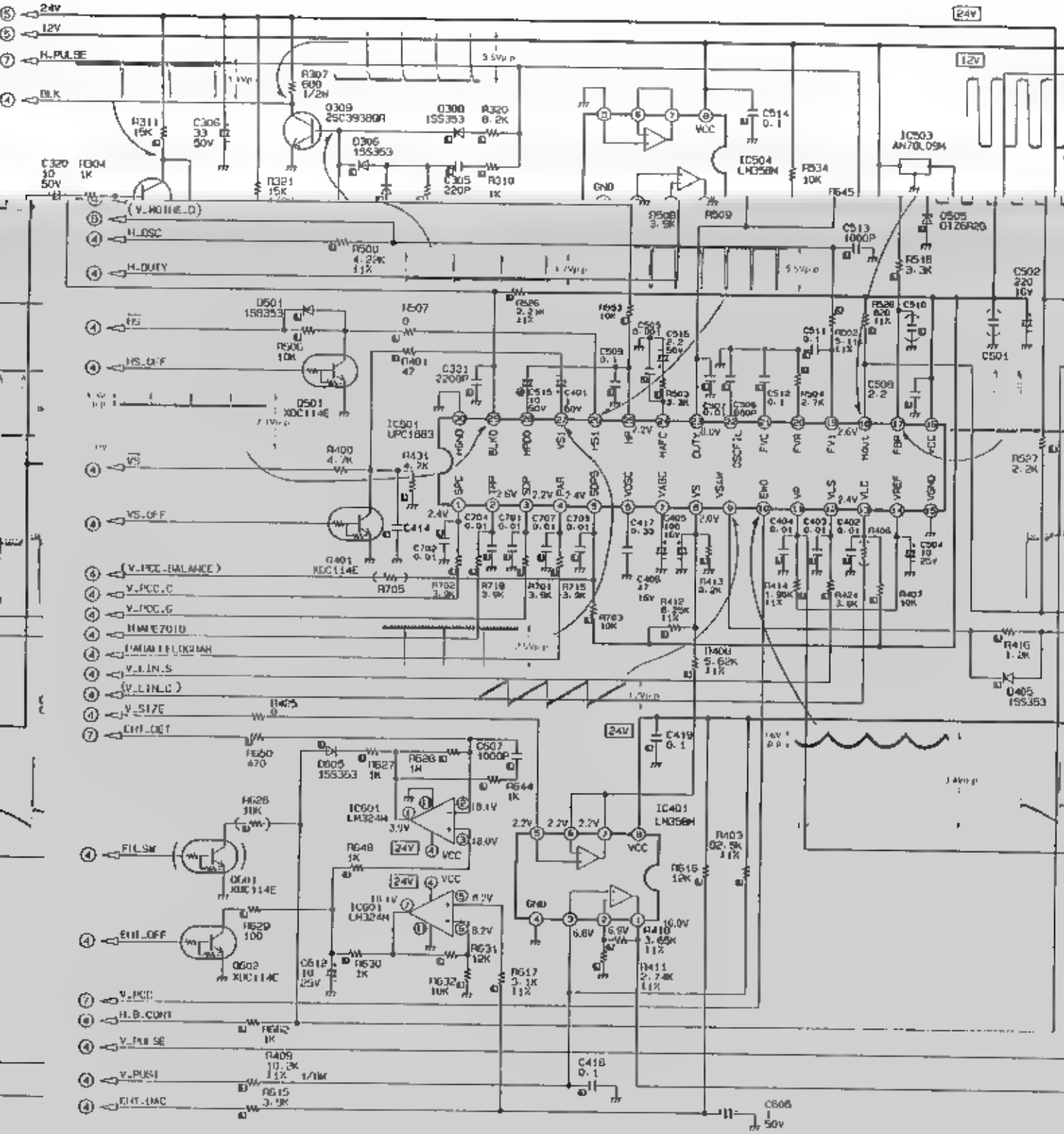

SHEET ③
IC1302
CY07PY2
R_IN
G_OUT
B_OUT
VCC_G
VCC_R
VCC_B
INC
C1310
22
160V
R1119
12K
2W
R1113
47K
1%
R1123
1K
C1110
1000P
500V
R1114
3.04K
1%
D1106
MA199
D1107
MA199
L1102
0.33
R1112
47
R1122
22
1/2W
S1101
TAG05P141T
R1013
47K
1%
R1023
1K
C1010
1000P
500V
R1014
3.09K
1%
D1006
MA199
D1007
MA199
L1002
0.33
R1012
100
R1022
22
1/2W
S1001
TAG05P141T
R1219
12K
2W
R1213
47K
1%
R1214
3.09K
1%
R1223
1K
C1210
1000P
500V
D1206
MA199
D1207
MA199
L1202
0.33
R1212
330
R1222
22
1/2W
S1201
TAG05P141T
HEATER
(N126-5)
C311
1000P
N301
PJS1A5280
KEY41JE
KEY41GE
R353
150
1/2W
R295
10K
1/2W
C394
1000P
200V
S390
TAG10003
D381
TAX125X103M
L381
TSK5029
D382
ERZTC4AK201
N105
204.0V
EHT
WHITE
S_FOCUS
D_FOCUS
(RED)
N3820
C303
2200P
2KV
L303
TSK0029
R1205
6.8K
C1208
C1207
2.2
100V
OSD_FB
VIDEO_OFF
100V
12V
R301
4.7K
Q331
2SA1016BR
11.4V
R302
1.5K
12.0V
D330
HZT33-09
D302
DTZ9R1C
R306
200K
1%
R305
34K
1%
D331
HZT33-09
R336
1.2M
1/2W
R337
10K
R381
1K
D383
EU02Z
-53.0V
R1404
22.1K
1%
D1402
1SS353
10.1V
9.3V
5.3V
VCC
C309
0.01
C301
IC351
LM358M
GND
R1405
5.62K
1%
4.0V
2.0V
1.0V
R1408
10K
1%
R1409
10K
1%
R1411
100
G1-B
ABL
4.6V
BLK
Q334
XDC114E
0.0V
10V
Q333
XDC114E
C339
0.047
250V
R380
120
N107A
N107B
C1309
1000P
200V
100V
N1040
TNPB00970 ⚠

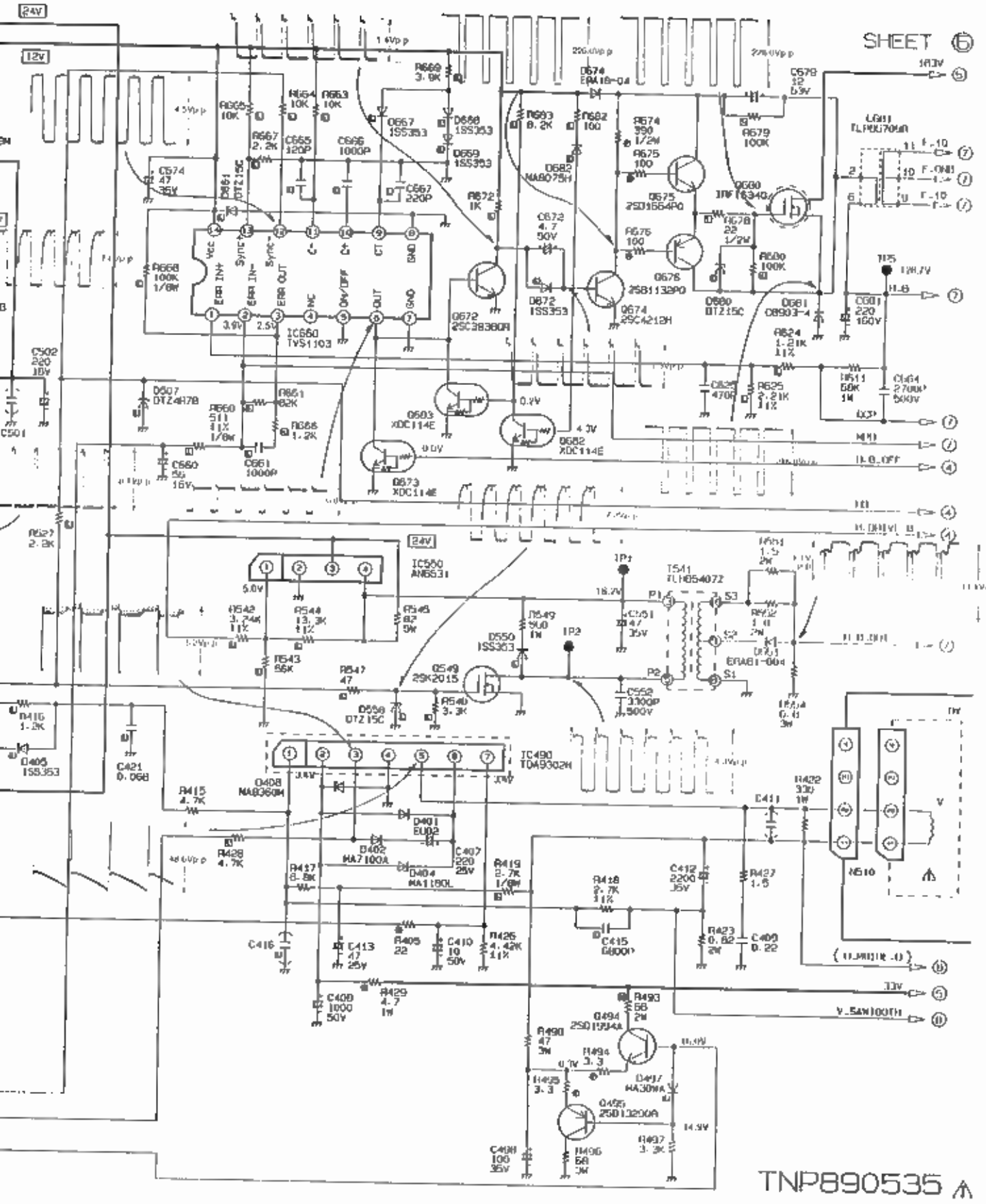

To CRT PCB
(N126)
TO Audio Key
N12A
TJS9A8740
L851
EXCELDR35
IC901
TVC80219-1E
or
TVC80219-AZE
MICROCONTROLLER
IC902
X24L08BTISN
or
TVR0AJ023
EEPROM
COM PORT
KEY SCAN IN
KEY SCAN IN
KEY SCAN IN
KEY SCAN IN
S/C CORRECTION 1
S/C CORRECTION 2
L/IN SWITCH
H.SYNC IN
V.SYNC IN
POWER_OFF
SUSPEND
STAND_BY
RESET
PSW_HEAT
(H_MOIRE_DN)
(V_MOIRE_DN)

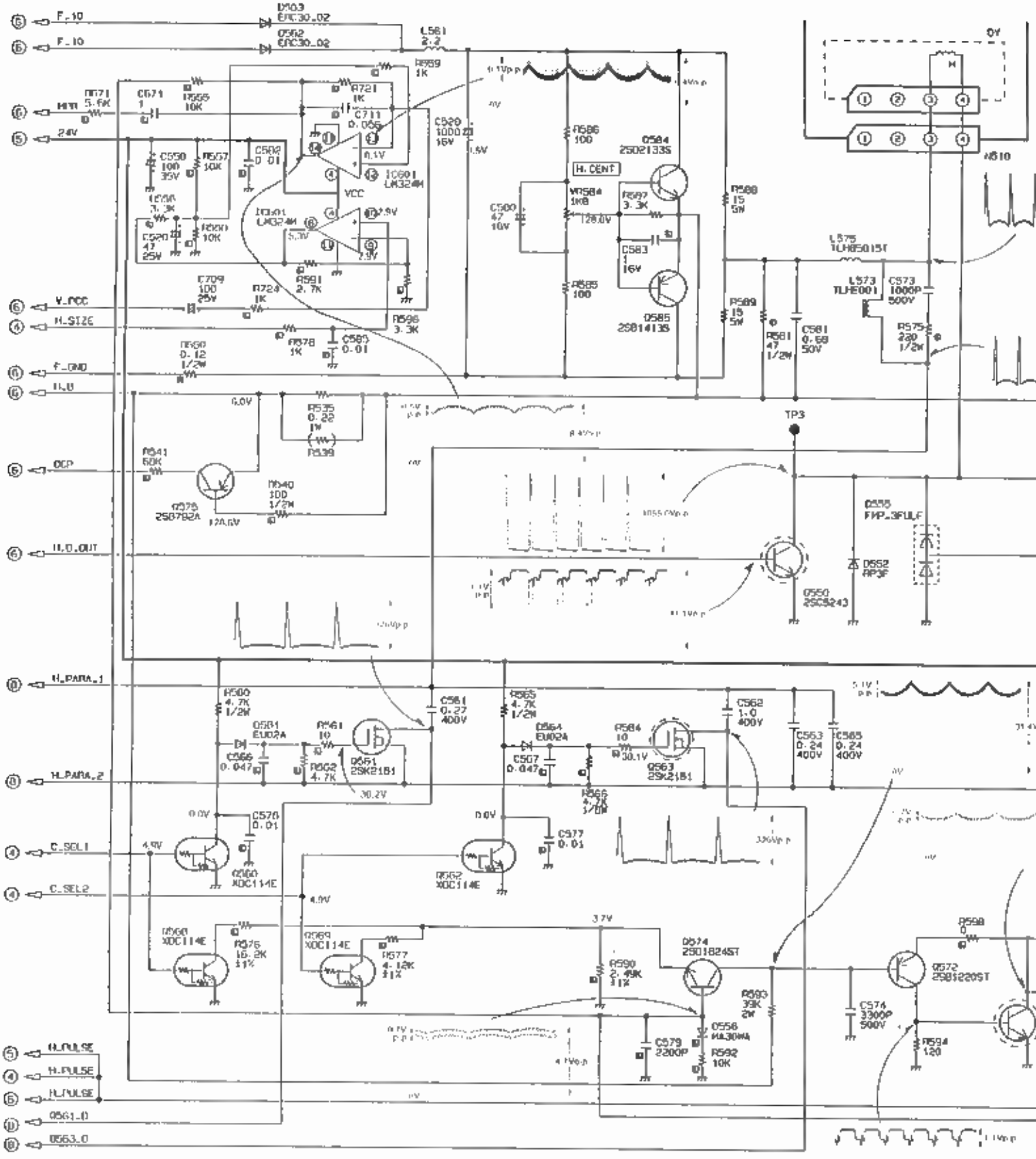

to Audio Key PCB
to CRT PCB (N701)
N22A
N7A
TJ35AD730
IC280
24LC21T/SN
C280
0.01
R285
301
1/8W
R282
301
1/8W
R281
301
1/8W
R288
R283
47K
R284
D202
DTZ5R6B
D203
DTZ5R6B
D201
DTZ5R6B
D200
DTZ5R6B
VIDEO
SIGNAL
INPUT
N103
TJ35AM82A
N21A
TO Audio
PCB
Audio
POWER
INDICATOR
5V
6.0V
Q901
KDA114E
R947
330
R946
100
D941
220
AMBER
D940
SML1816W
R913
56K
R912
56K
R911
56K
R910
56K
R915
56K
1/8W
R914
56K
1/8W
R952
22K
R951
22K
R950
22K
R949
22K
SW904
EVQPD005
SW903
EVQPD005
SW902
EVQPD005
SW901
EVQPD005
IC751
M66346BFP
VCC
VDD
AD11
AD10
AD12
AD9
AD8
D0
AD7
LD
CLK
AD6
DI
AD5
AD1
AD4
AD2
AD3
GND
VSS
R944
10K
R938
470
C904
0.01
(7.AX|S)
(V.MOIRE.C)
(H.MOIRE.C)
(V.A.IN.C)
(V.PCC.BALANCE)
R902
100
R933
100
R932
100
D947
DTZ5R6B
C590
1000P
C521
470
6.3V
L521
560
C526
3.3
50V
R941
22K
R940
22K
R943
10K
R937
470
C903
0.01
R934
100
R935
100
D907
D905
DTZ5R6B
R539
143K
±1%
R537
560
±1%
C751
0.01
C527
3.3
50V
IC502
M66346BFP
H.POSI
H.DRIVE.D
V.IN.S
H.FREZOID
V.PCC.G
V.PCC.C
V.POSI
V.SIZE
H.OSC
VS_OFF
HS_OFF
HD
EHT_OFF
HLB_OFF
C_SEL1
C_SEL2
FIL_SW
TNP890535

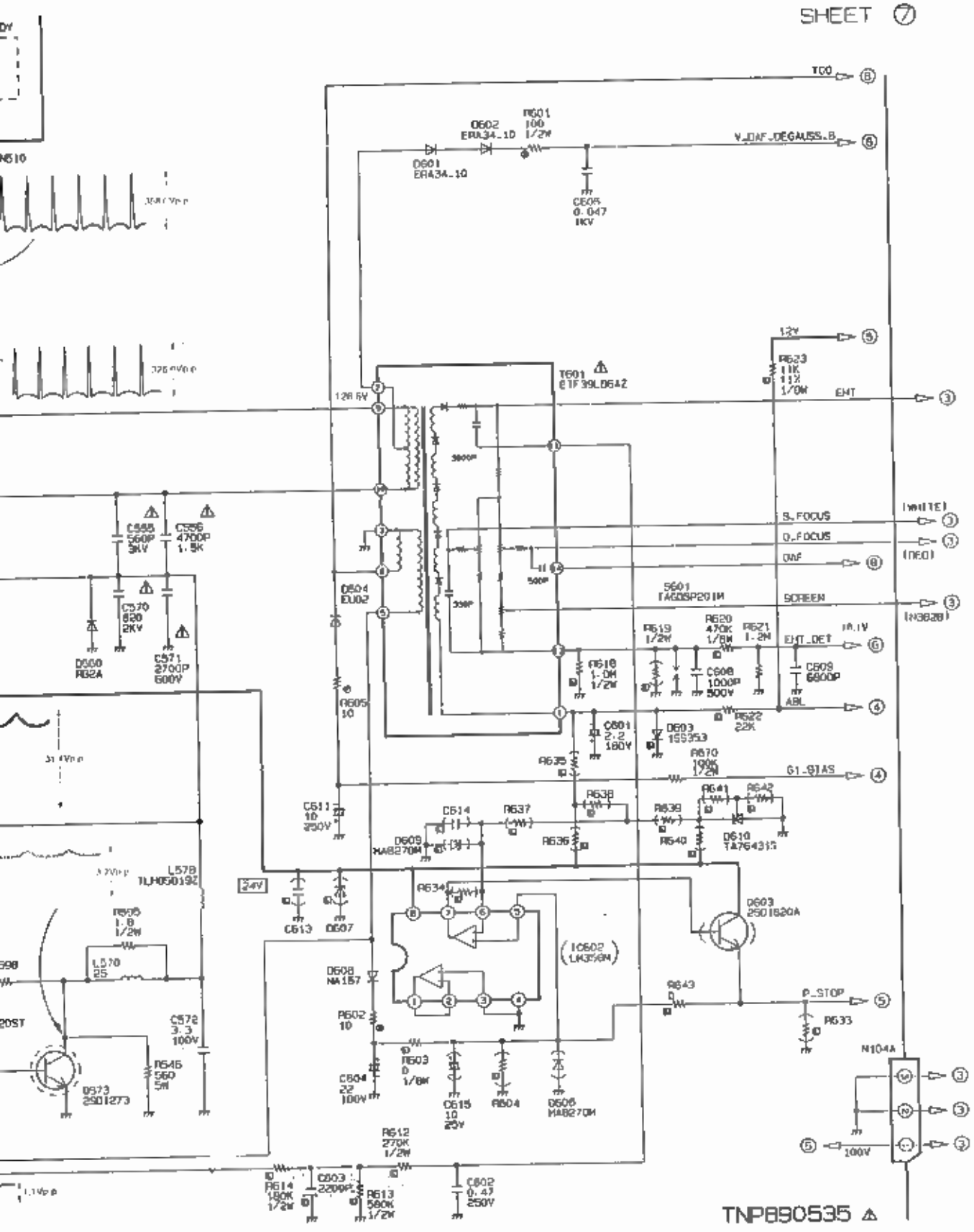

at AC 100 V 94 V
at AC 120 V 106 V
at AC 220 V 200 V
at AC 240 V 220 V
AC 100 - 240V
50/60Hz
FS801/FS803
5W301 ESB91231A
L602 TLP852339
D608 RBV406M
C833
C834 1000P
D840 ERB91-02
L840 EXCELOR35
R840 0.39 1W
C835 1000P 35V
D603 ERA2VEA431
C814 1 400V
C815 0.1 400V
P1
P2
P3
P4
S6
S4
S3
S2
S1
D845 ERC30-02
L845 EXCELOR35
R845 0.11
C861 0.11
D844 RL42
L844 EXCELOR35
R844 0.12 1/2W
D843 RG2
L843 EXCELOR35
R843 0.12 1/2W
L822 EXCELOR35
D842 ERC38-06
C842 150P 2KV
R842 1.2 1/2W
D841 RG2A
D850 RG2A
L821 EXCELOR35
D821 ERA34-10
C821 0.047 250V
R821 33K 3W
R836 22K 2W
R837 22K 2W
D820 2SC4620
R819 220K
R804 470 1/8W
R820 220K
C818
C819 100P 1KV
D817 DTZ16B
C824 10 50V
R814 150
R813 1.5K
C822 2200P
C823 4.7 50V
C828 47 50V
R815 680 Ω
R802 2.7K
R807 5.6K 1/8W
C820 0.022
D809 1SS353
R808 470
D819 DTZ24B
C825 3.3 50V
R816 2.55K 1%
C829 220 35V
R817 6.8 1/2W
D807 EG01Z
C831
C832 1000P
R850 2.2K 1%
R857 56K
C854 0.22
Q803 2SD1819
D852 DTZ6.8A
ERROR
PC830 PC123FYB
OVP
PC831 PC123FYB
C839 330 6.3V
R809 22K 1/2W
TRIGGER
PC832 TLP250
R818
C826
R847 1.2K 1/2W
0.2V
TNP890535
PRIMARY
SECONDARY

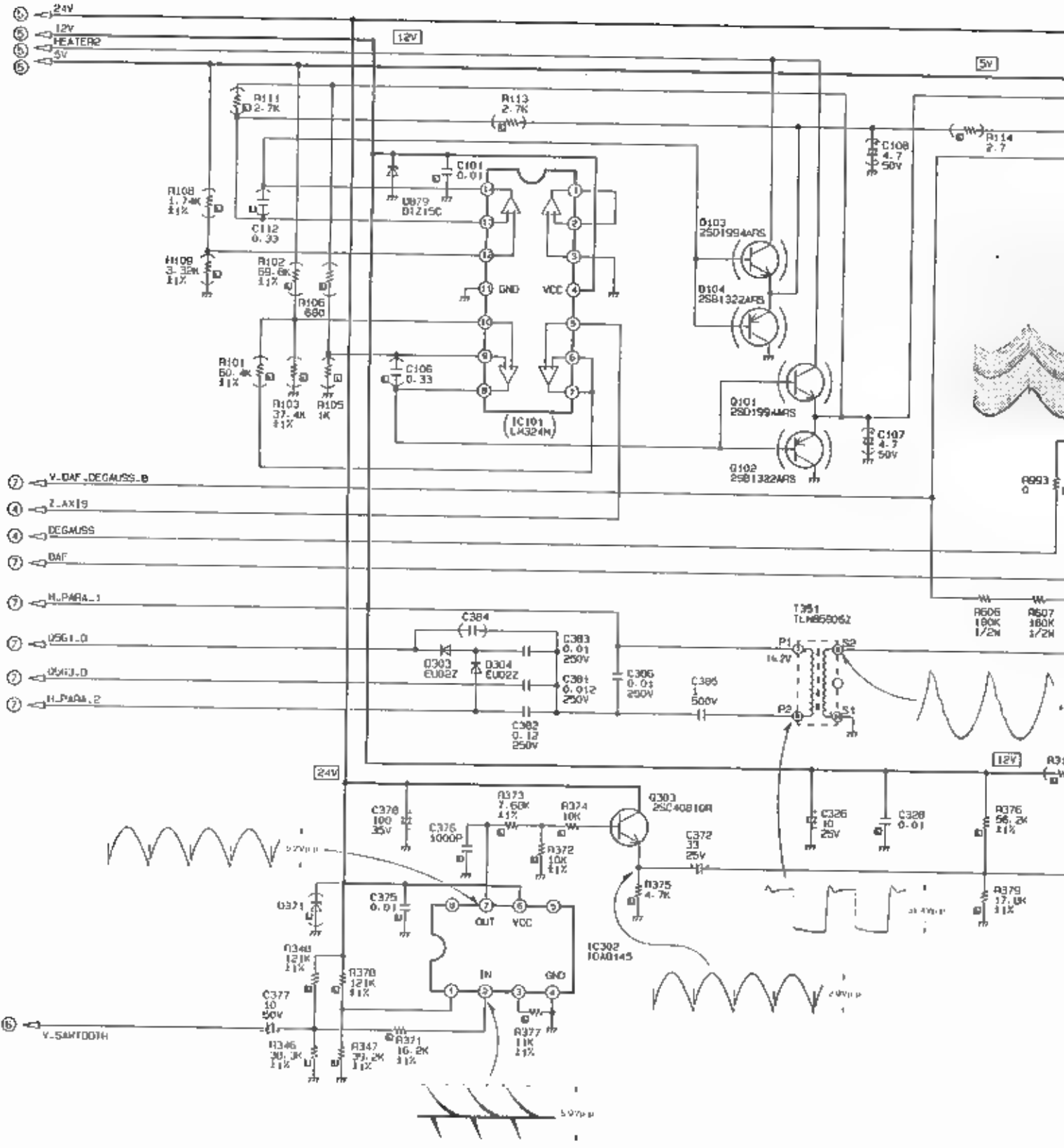

SHEET
IC876
L78L05C_NA
IN CD GND RESET OUT
5V
5V
RESET
Audio_B
IC875
SI-3120FA
GND ON/OFF OUT VS IN
Audio_B
IC877
SI-3025F
HEATER2
HEATER
IC871
SI-3120FA
12V
12V
12V
12V
15V
POWER_OFF
IC873
SI-3240CA
PSW_HEAT
IC870
MSF7824
24V
24V
24V
33V
SUSPEND
183V
STAND_BY
100V
P_5100
U_PULSE
Audio_B
F_GND
10 AUDIO PCB
Audio_0
15V
35V
105V
10 ADJ

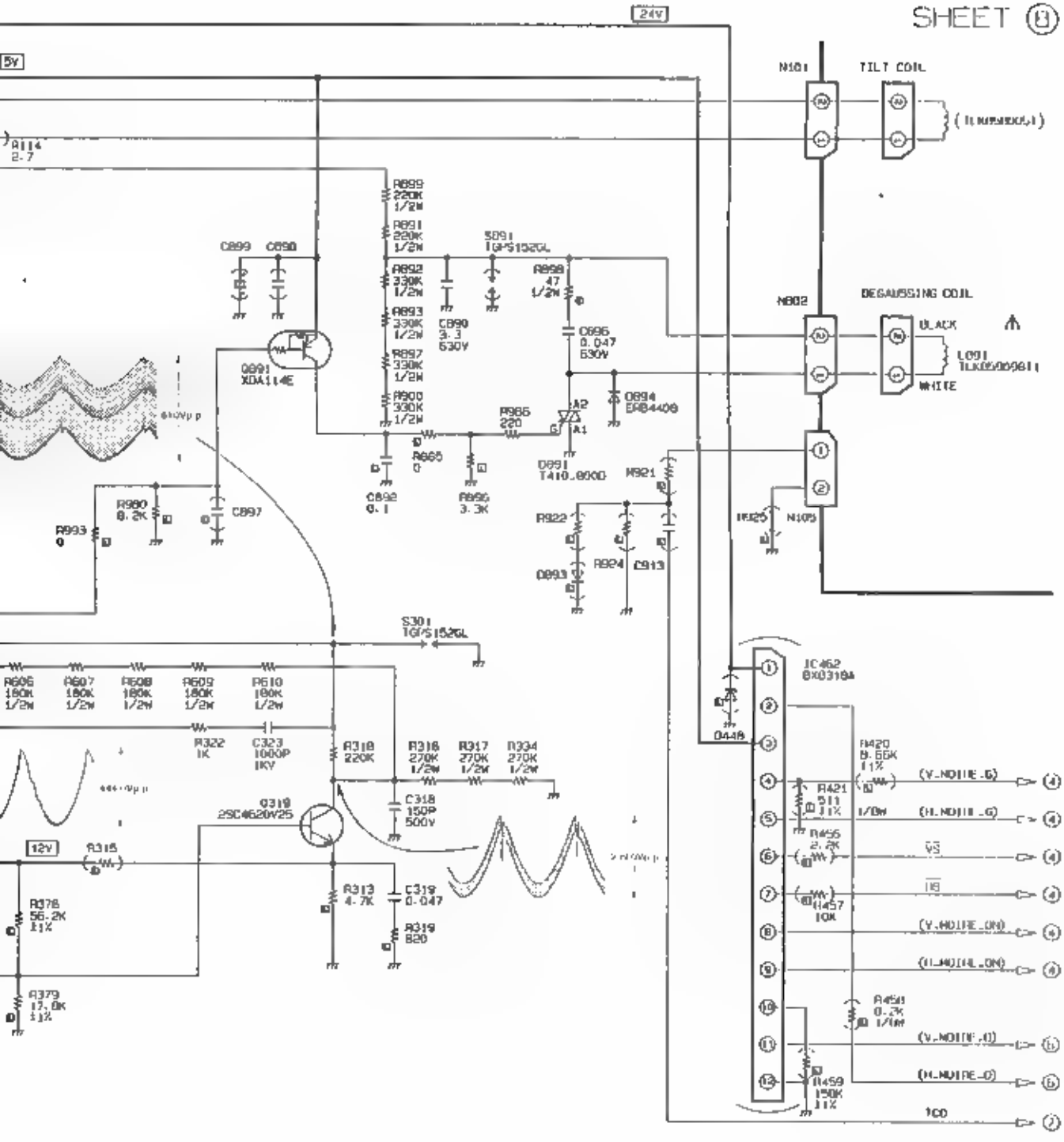

24V
12V
H-PULSE
BLK
IC504 LM358M
IC503 AN7805M
IC501 UPC1883
IC601 LM324M
IC401 LM358M
Q501 XDC114E
Q401 XDC114E
Q602 XDC114C
D501 1SS353
D401 1SS353
D405 1SS353
D605 1SS353
D309 2SC3938B
D300 1SS353
D306 1SS353
(V_HOME_D)
H_OSC
H_DUTY
VS
VS_OFF
(V_PCC_BALANCE)
V_PCC_C
V_PCC_G
(V_LIN_S)
(V_LIN_C)
V_SIZE
EHT_DET
FIL_SW
EHT_OFF
V_PCC
H_B_CONT
V_PULSE
V_PUSH
EHT_DAC


SHEET 6
24V
12V
IC660 TVS1103
IC550 AN6531
IC490 TDA9302H
T541 ELH054072
T501 ERA81-004
N510
TNP890535 A

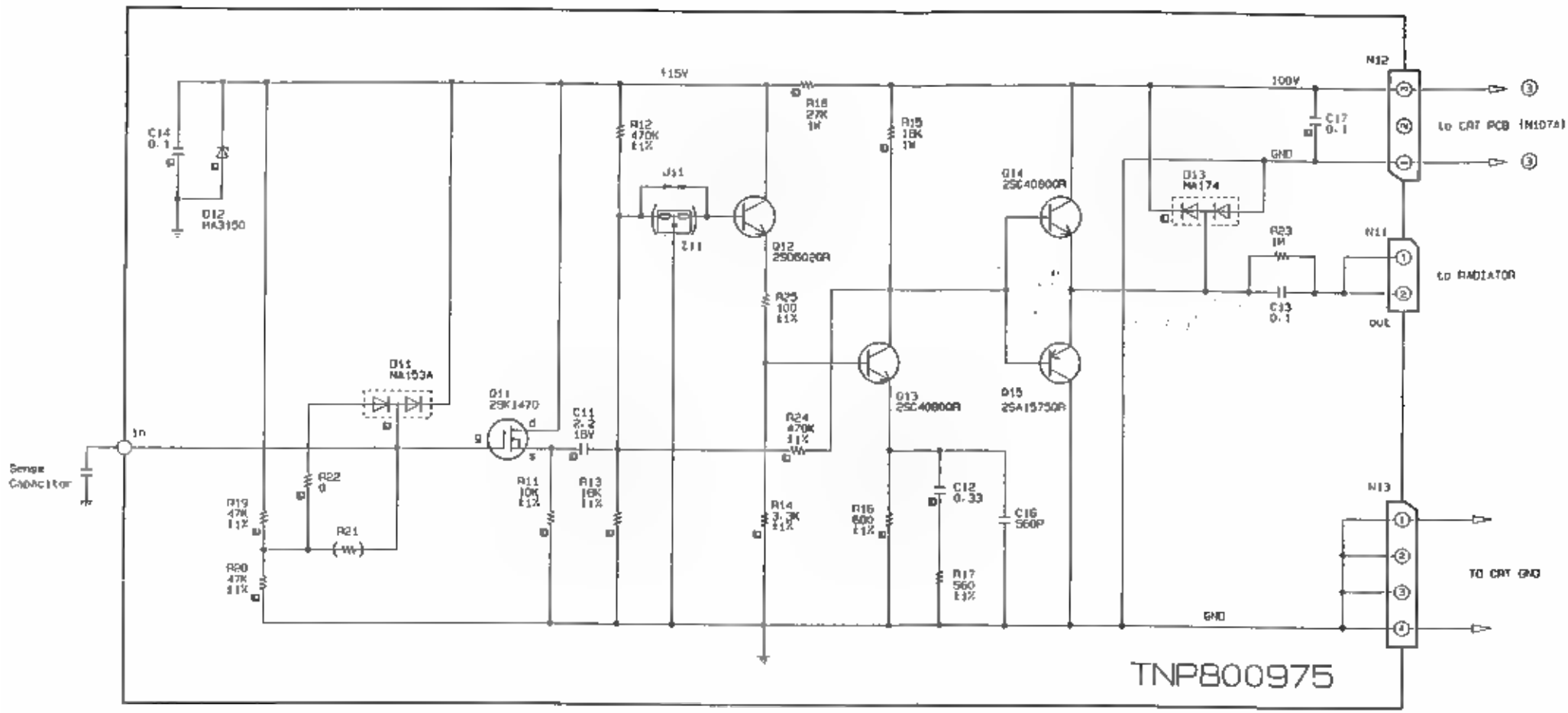

F_10
F_10
H_IN
24V
V_VCC
H_SIZE
F_GND
H_B
OCP
H_D_OUT
H_PARA_1
H_PARA_2
C_SEL1
C_SEL2
H_PULSE
H_PULSE
H_PULSE
Q561_D
Q563_D
0V
TP3
H. CENT
VCC
FMP_3FULF

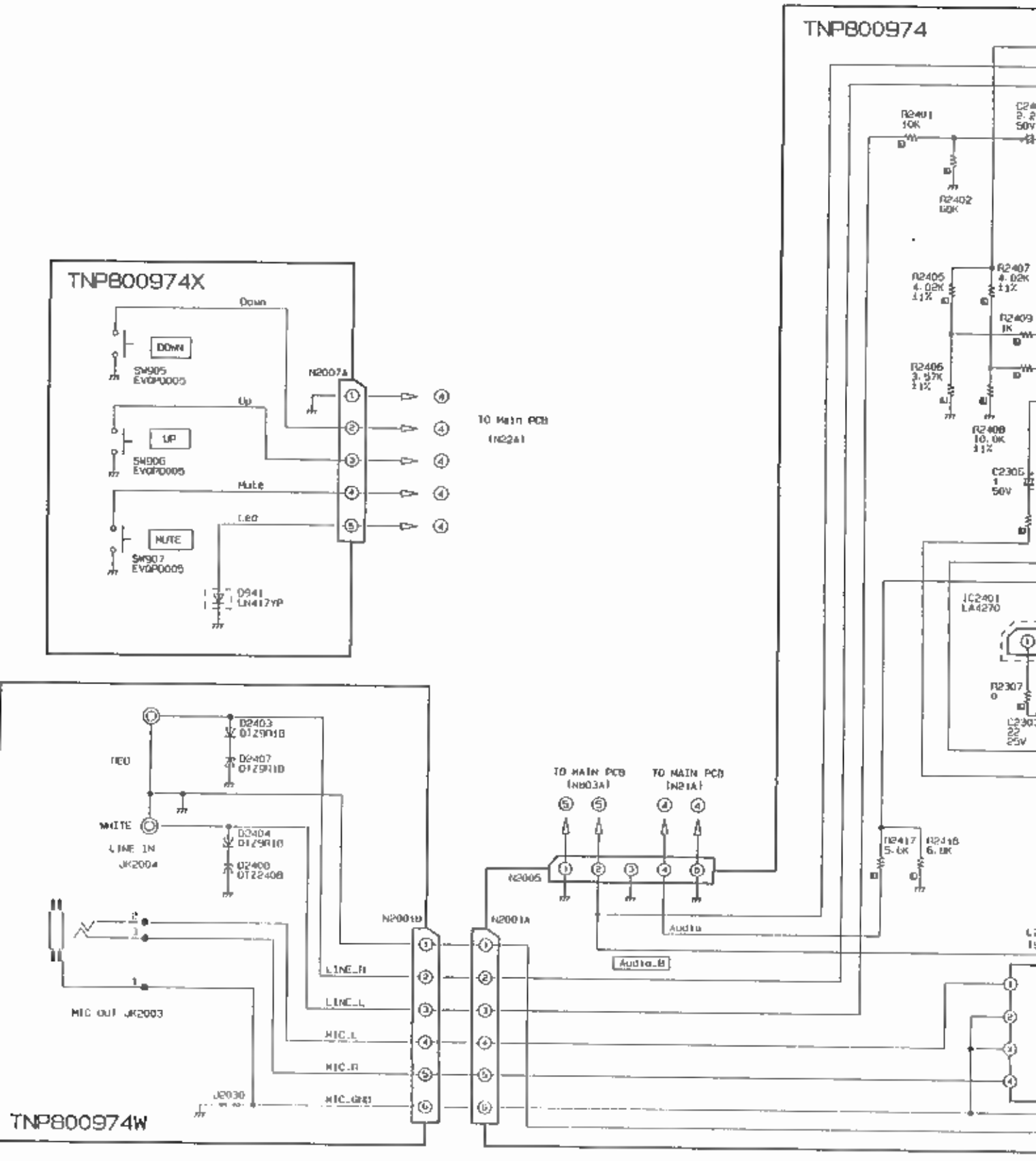

TO0
V_DAF_DEGAUSS
12V
EHT
T601
S_FOCUS
D_FOCUS
DAF
SCREEN
EHT_DET
ABL
G1_BIAS
P_STOP
D603
2501820A
IC602
LM359N
D608
NA157
D609
HA82704
D610
TA76431S
D607
D606
MA8270M
L570
L578
TLH050192
N104A
TNP890535

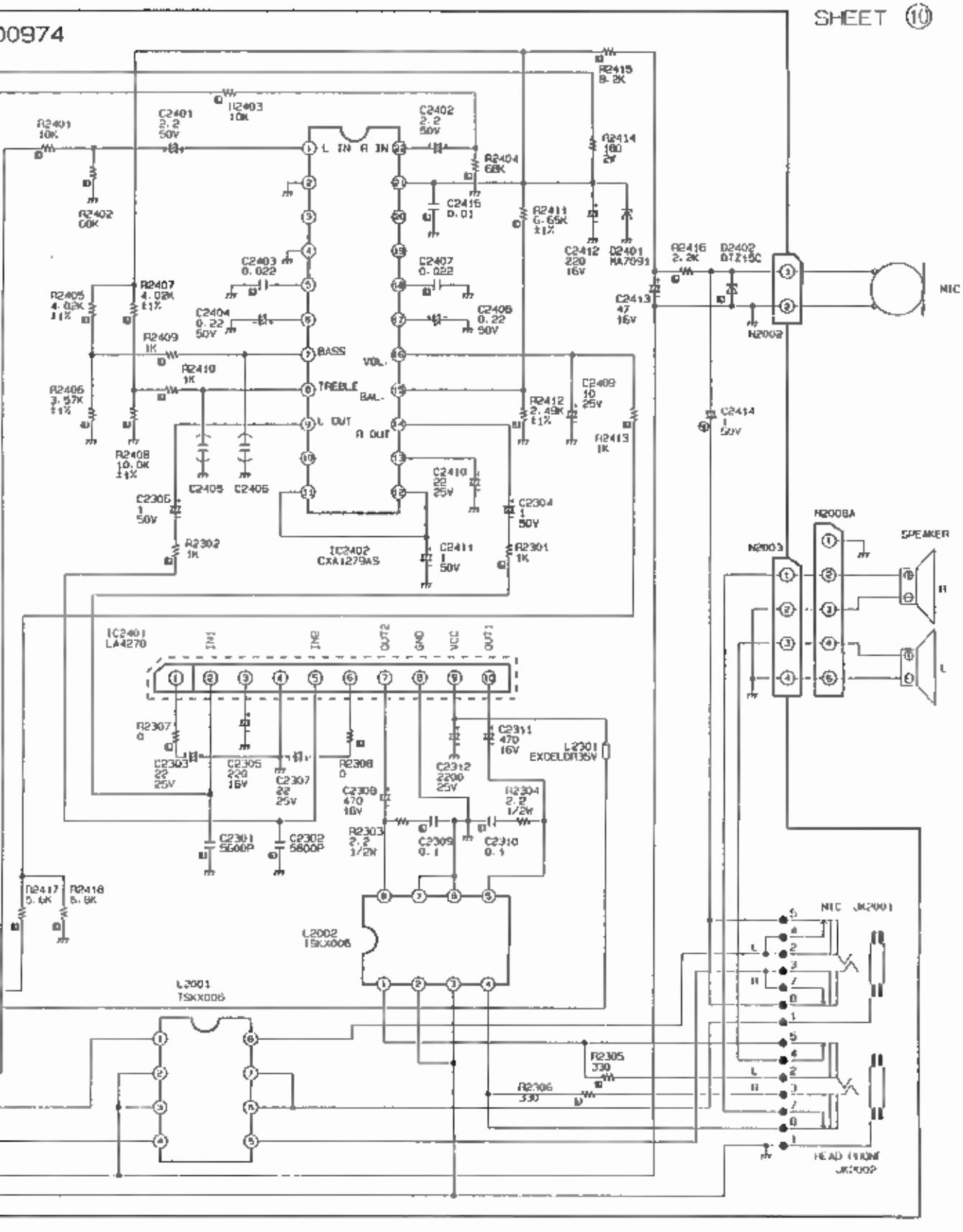

24V
12V
HEATER2
5V
12V
5V
R111 2.7K
R113 2.7K
R114 2.7
C108 4.7 50V
C101 0.01
D879 DIZ15C
R108 1.74K ±1%
C112 0.33
R109 3.32K ±1%
R102 69.8K ±1%
R106 680
R101 60.4K ±1%
R103 37.4K ±1%
R105 1K
C106 0.33
IC101 (LA324M)
GND
VCC
Q103 2SD1994ARS
Q104 2SB1322ARS
Q101 2SD1994ARS
Q102 2SB1322ARS
C107 4.7 50V
R993
V_DAF_DEGAUSS_B
Z_AXIS
DEGAUSS
DAF
H_PARA_1
VSG1_D
VSG2_D
H_PARA_2
C384
D303 EU02Z
D304 EU02Z
C383 0.01 250V
C381 0.012 250V
C382 0.12 250V
C306 0.01 250V
C385 1 500V
T351 TLM8S806Z
P1
P2
S2
S1
14.2V
R606 180K 1/2W
R607 180K 1/2W
24V
12V
C370 100 35V
C376 1000P
R373 7.68K ±1%
R374 10K
R372 10K ±1%
Q303 2SC4081QR
C372 33 25V
R375 4.7K
C326 10 25V
C328 0.01
R376 56.2K ±1%
R379 17.8K ±1%
C375 0.01
OUT
VCC
IC302 10A0145
IN
GND
R348 121K ±1%
R378 121K ±1%
R377 1K ±1%
C377 10 50V
V_SAWTOOTH
R346 30.1K ±1%
R347 39.2K ±1%
R371 16.2K ±1%

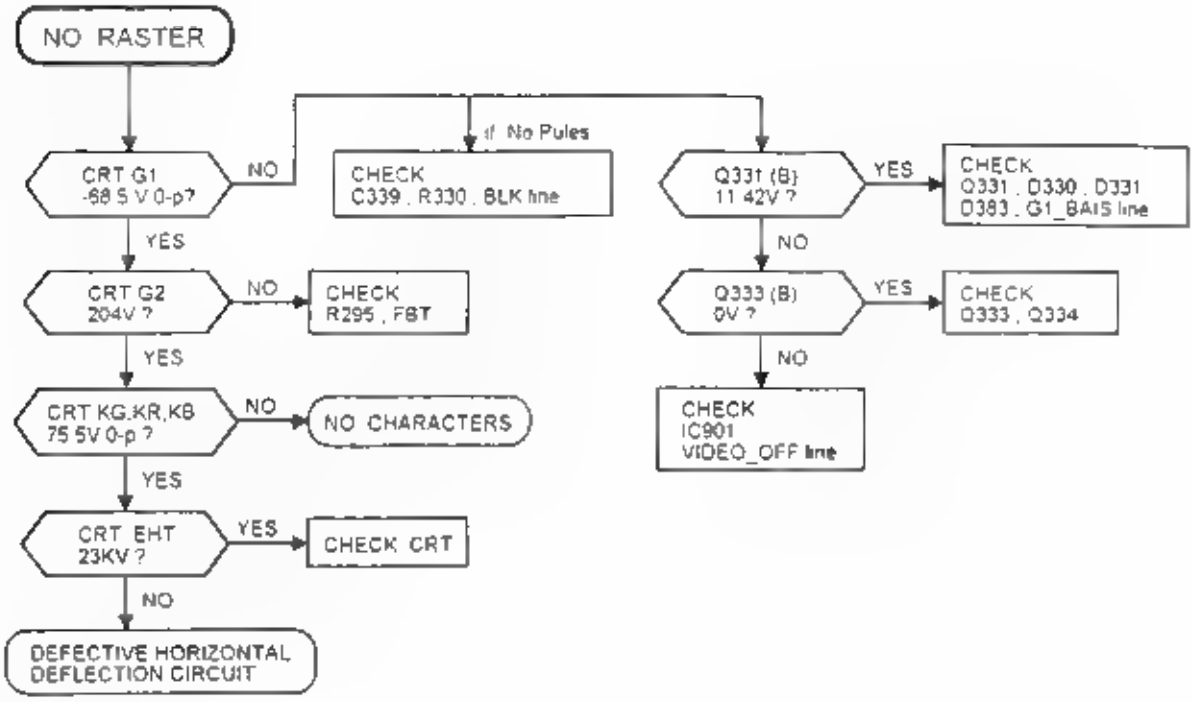

SHEET 8
24V
5V
12V
N101
TILT COIL
N802
DEGAUSSING COIL
BLACK
WHITE
L091
S091
TGFS152GL
Q891
2SA1114E
D891
T410.0000
D894
EGB4400
S301
TGFS152GL
Q319
2SC4620V25
IC462
BX0319A
R899 220K 1/2W
R891 220K 1/2W
R892 330K 1/2W
R893 330K 1/2W
R897 330K 1/2W
R900 330K 1/2W
R898 47 1/2W
R965 220
R665 0
R892 0.1
R896 3.3K
R980 8.2K
R993 0
C899
C890
C890 3.3 630V
C896 0.047 630V
C897
R606 180K 1/2W
R607 180K 1/2W
R608 180K 1/2W
R609 180K 1/2W
R610 180K 1/2W
R322 1K
C323 1000P 1KV
R318 220K
R316 270K 1/2W
R317 270K 1/2W
R334 270K 1/2W
C318 150P 500V
R313 4.7K
C319 0.047
R319 820
R315
R378 56.2K ±1%
R379 17.8K ±1%
R921
R922
R924
C913
R893
R425
N105
0448
R420 9.66K ±1%
R421 511 ±1% 1/8W
R456 2.2K
R457 10K
R454 0.2K 1/4W
R459 150K ±1%
(V_NOISE_G)
(H_NOISE_G)
VS
HB
(V_NOISE_ON)
(H_NOISE_ON)
(V_NOISE_O)
(H_NOISE_O)
VCC

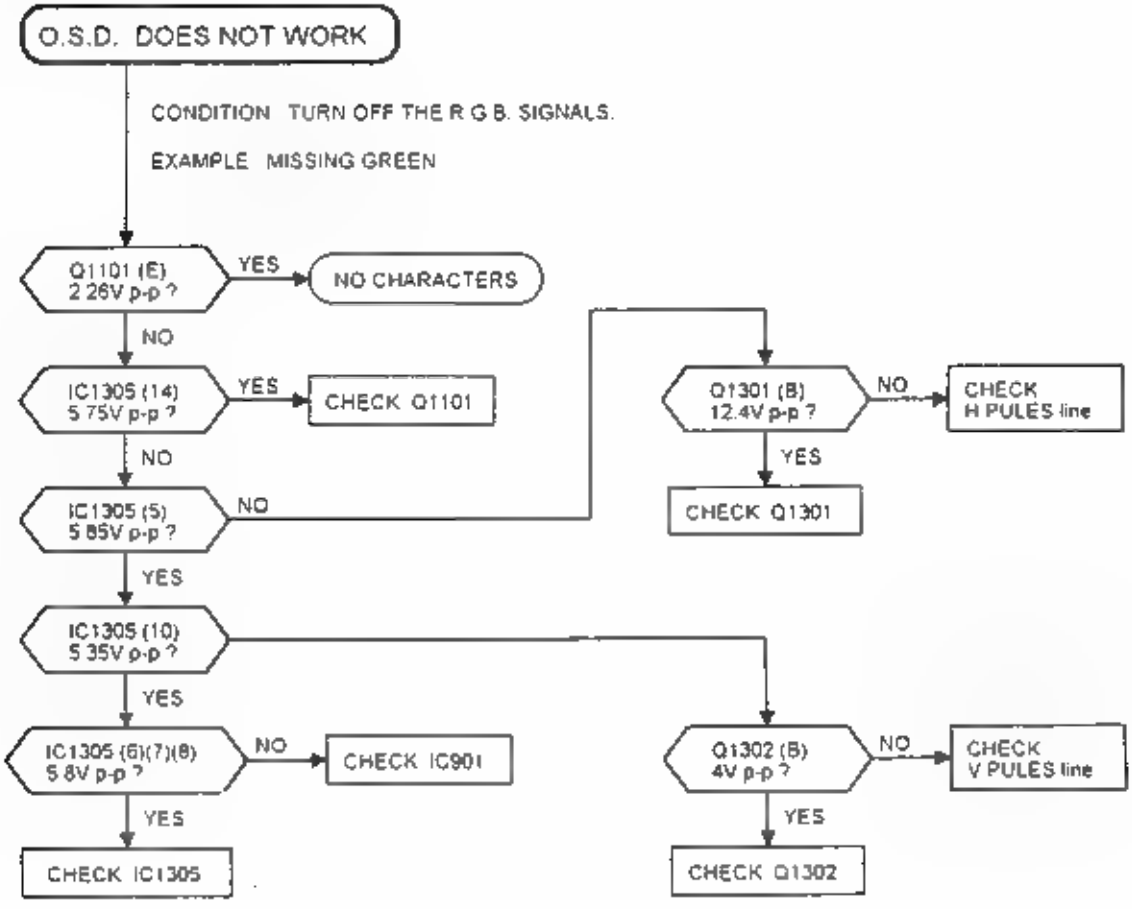
TNP890535 ⚠

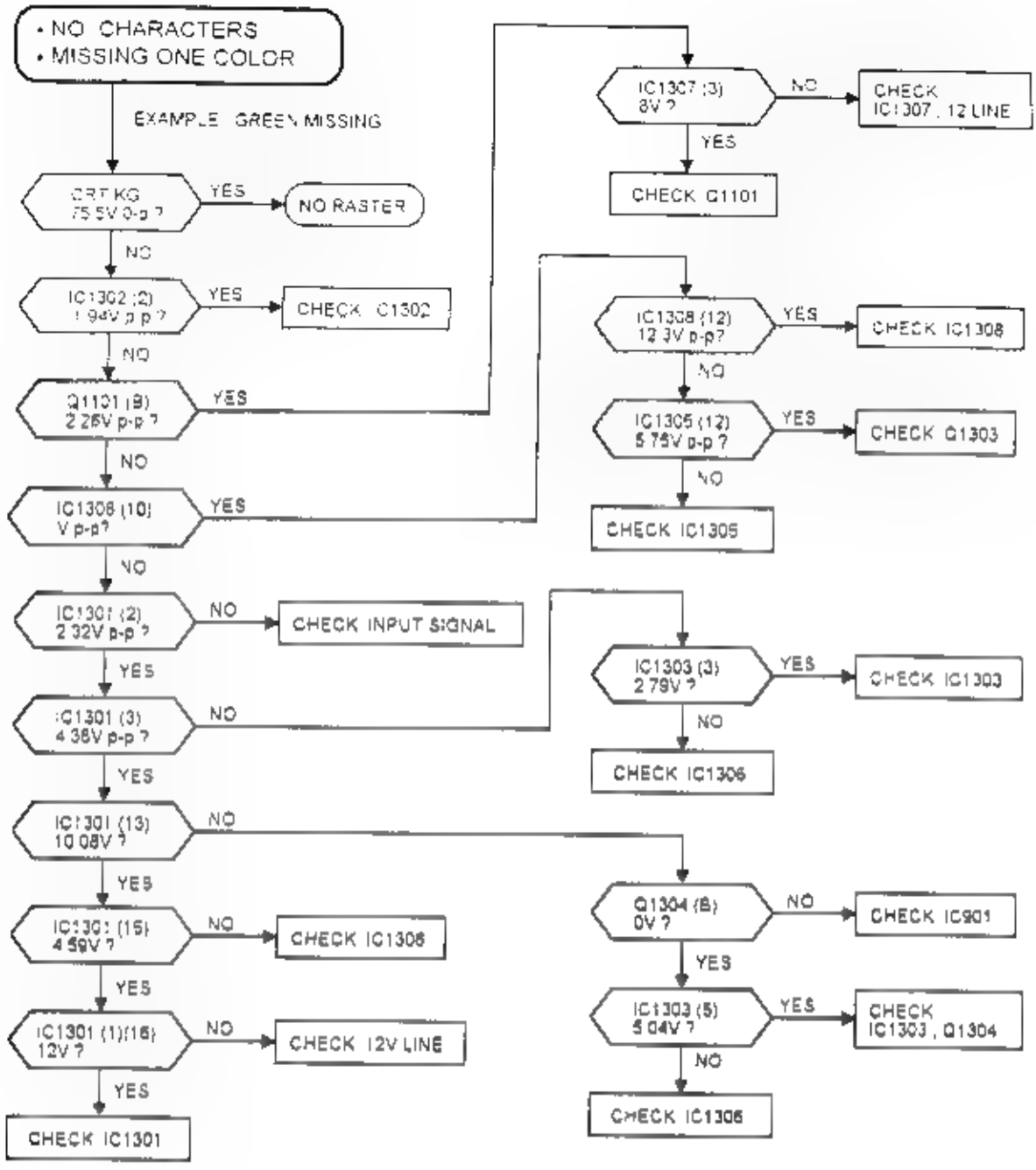

C14
0.1
D12
HA3150
+15V
R12
470K
±1%
J11
R18
27K
1W
R15
18K
1W
Q12
2SD602QR
Q14
2SC4080QR
D13
HA174
100V
C17
0.1
GND
N12
to CAT PCB (N107A)
R23
1M
C33
0.1
N11
to RADIATOR
OUT
D11
HA153A
D11
2SK1470
C11
2.2
16V
R24
470K
±1%
Q13
2SC4080QR
D15
2SA1575QR
In
Sense
Capacitor
R22
0
R19
47K
±1%
R21
(-W-)
R20
47K
±1%
R11
10K
±1%
R13
18K
±1%
R14
3.3K
±1%
R16
680
±1%
C12
0.33
C16
560P
R17
560
±1%
GND
N13
TO CAT GND
TNP800975

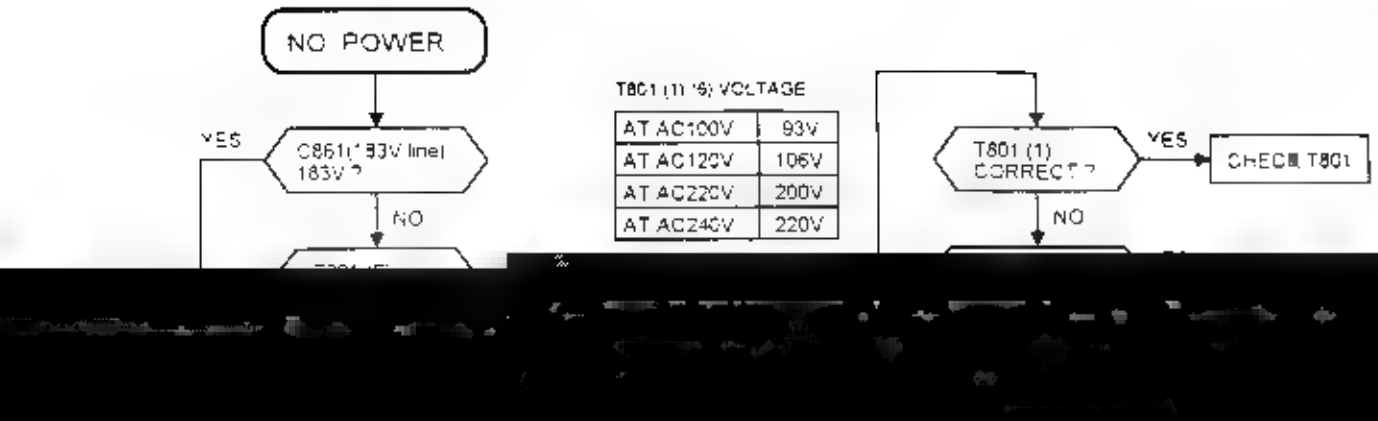

TNP800974
TNP800974X
Down
DOWN
SW905
EVQP0005
Up
UP
SW906
EVQP0005
Mute
MUTE
SW907
EVQP0005
LED
D941
LN417YP
N2007A
TO MAIN PCB
(N22A)
R2401
10K
R2402
62K
R2405
4.02K
±1%
R2407
4.02K
±1%
R2409
1K
R2406
3.57K
±1%
R2408
10.0K
±1%
C2305
1
50V
IC2401
LA4270
R2307
0
TO MAIN PCB
(NB03A)
TO MAIN PCB
(N21A)
N2005
R2417
5.6K
R2418
6.8K
Audio
Audio_R
N2001B
N2001A
D2403
DTZ9V1B
D2407
DTZ9V1B
LED
MUTE
LINE IN
JK2004
D2404
DTZ9V1B
D2400
DTZ24VB
MIC OUT JK2003
LINE_R
LINE_L
MIC_L
MIC_R
MIC_GND
J2030
TNP800974W

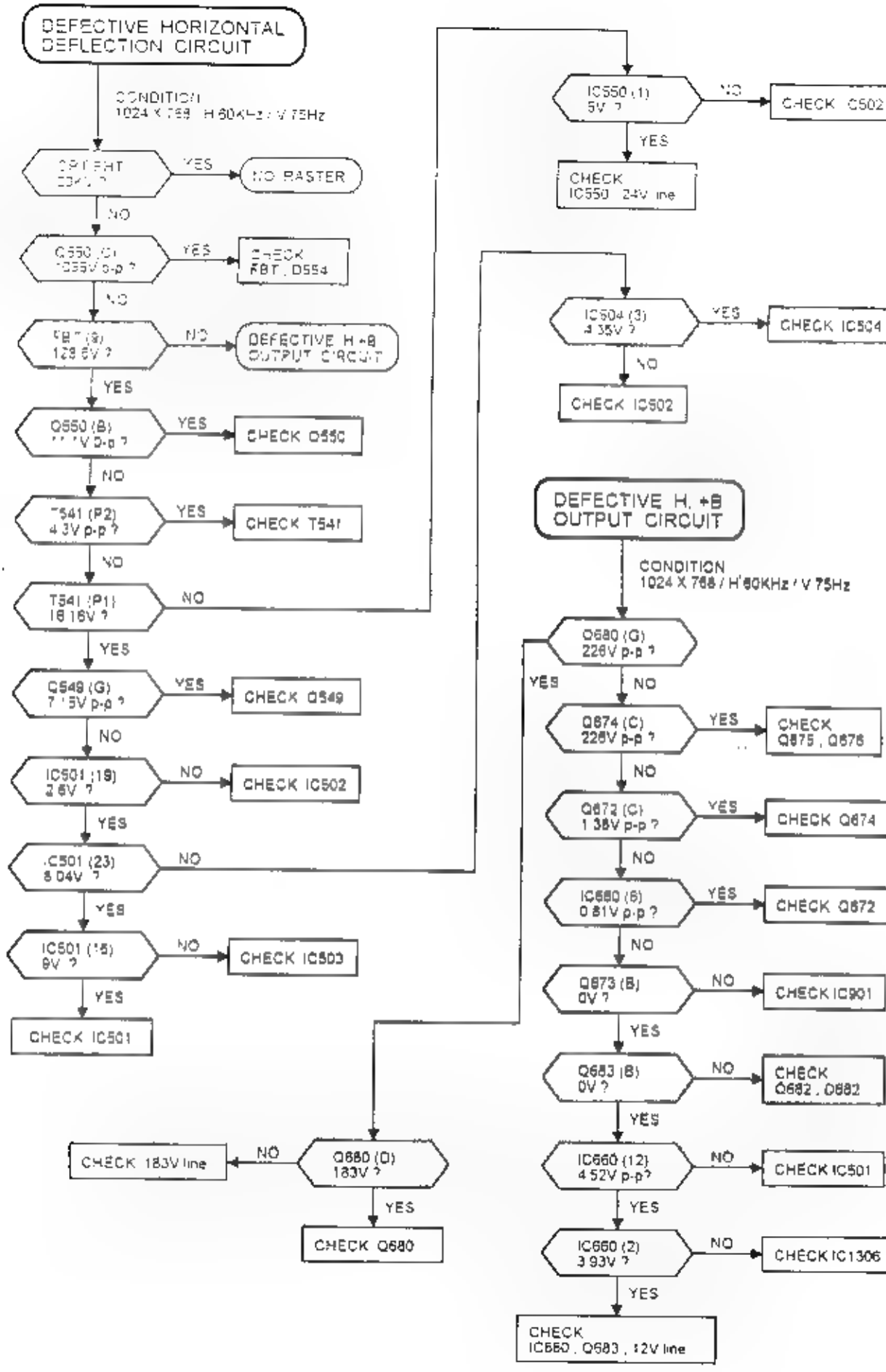

00974
R2401 10K
C2401 2.2 50V
IC2403 10K
C2402 2.2 50V
R2415 8.2K
R2414 180 2W
R2404 68K
C2416 0.01
R2411 6.65K ±1%
C2412 220 16V
D2401 MA7091
R2416 2.2K
D2402 DTZ15C
NIC
N2002
C2413 47 16V
R2402 68K
C2403 0.022
C2407 0.022
R2405 4.02K ±1%
R2407 4.02K ±1%
C2404 0.22 50V
C2408 0.22 50V
R2409 1K
R2410 1K
BASS
TREBLE
L OUT
R OUT
VOL.
BAL.
R2406 3.57K ±1%
R2408 10.0K ±1%
C2409 10 25V
R2412 2.49K ±1%
R2413 1K
C2414 1 50V
C2405
C2406
C2305 1 50V
C2410 25V
C2304 1 50V
R2302 1K
IC2402 CXA1279AS
C2411 1 50V
R2301 1K
N2003
N2003A
SPEAKER
R
L
IC2401 LA4270
IN1
IN2
OUT2
GND
VCC
OUT1
R2307 0
C2303 220 25V
C2305 220 16V
C2307 22 25V
R2308 0
C2311 470 16V
L2301 EXCELDR35V
C2312 2200 25V
C2308 470 10V
R2304 2.2 1/2W
R2303 2.2 1/2W
C2309 0.1
C2310 0.1
C2301 5600P
C2302 5600P
R2417 5.6K
R2418 5.6K
L2002 TSKX006
L2001 TSKX006
NIC JK2001
HEAD PHONE JK2002
R2305 330
R2306 330

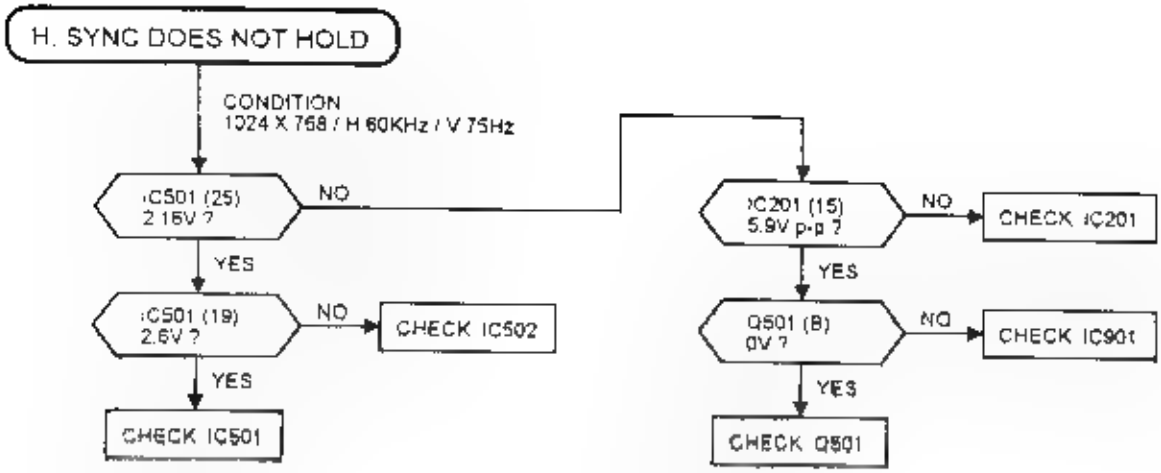

NO RASTER
CRT G1 -68 5 V 0-p?
NO
if No Pules
CHECK C339 , R330 , BLK line
YES
CRT G2 204V ?
NO
CHECK R295 , FBT
YES
CRT KG,KR,KB 75 5V 0-p ?
NO
NO CHARACTERS
YES
CRT EHT 23KV ?
YES
CHECK CRT
NO
DEFECTIVE HORIZONTAL DEFLECTION CIRCUIT
Q331 (B) 11 42V ?
YES
CHECK Q331 , D330 , D331 D383 , G1_BAIS line
NO
Q333 (B) 0V ?
YES
CHECK Q333 , Q334
NO
CHECK IC901 VIDEO_OFF line


O.S.D. DOES NOT WORK
CONDITION TURN OFF THE R G B. SIGNALS.
EXAMPLE MISSING GREEN
Q1101 (E) 2 26V p-p ?
YES
NO CHARACTERS
NO
IC1305 (14) 5 75V p-p ?
YES
CHECK Q1101
NO
IC1305 (5) 5 85V p-p ?
NO
YES
IC1305 (10) 5 35V p-p ?
YES
IC1305 (6)(7)(8) 5 8V p-p ?
NO
CHECK IC901
YES
CHECK IC1305
Q1301 (B) 12.4V p-p ?
NO
CHECK H PULES line
YES
CHECK Q1301
Q1302 (B) 4V p-p ?
NO
CHECK V PULES line
YES
CHECK Q1302

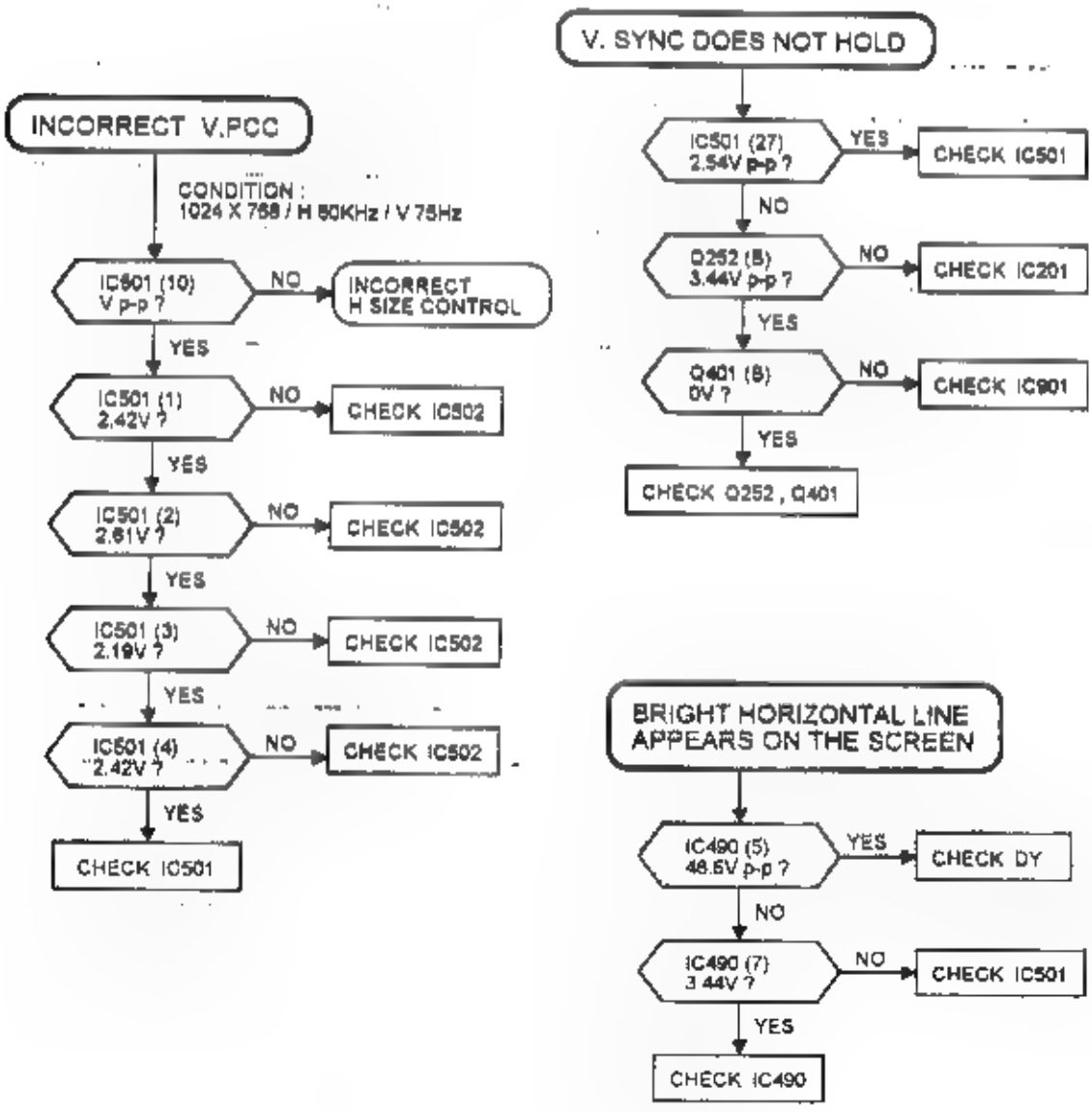

• NO CHARACTERS
• MISSING ONE COLOR
EXAMPLE GREEN MISSING
CRT KG 75.5V p-p ?
YES
NO RASTER
NO
IC1302 (2) 1.94V p-p ?
YES
CHECK C1302
NO
Q1101 (8) 2.26V p-p ?
YES
NO
IC1308 (10) V p-p ?
YES
NO
IC1301 (2) 2.32V p-p ?
NO
CHECK INPUT SIGNAL
YES
IC1301 (3) 4.38V p-p ?
NO
YES
IC1301 (13) 10.08V ?
NO
YES
IC1301 (15) 4.59V ?
NO
CHECK IC1308
YES
IC1301 (1)(16) 12V ?
NO
CHECK 12V LINE
YES
CHECK IC1301
IC1307 (3) 8V ?
NO
CHECK IC1307, 12 LINE
YES
CHECK Q1101
IC1308 (12) 12.3V p-p?
YES
CHECK IC1308
NO
IC1305 (12) 5.75V p-p ?
YES
CHECK Q1303
NO
CHECK IC1305
IC1303 (3) 2.79V ?
YES
CHECK IC1303
NO
CHECK IC1306
Q1304 (B) 0V ?
NO
CHECK IC901
YES
IC1303 (5) 5.04V ?
YES
CHECK IC1303, Q1304
NO
CHECK IC1306

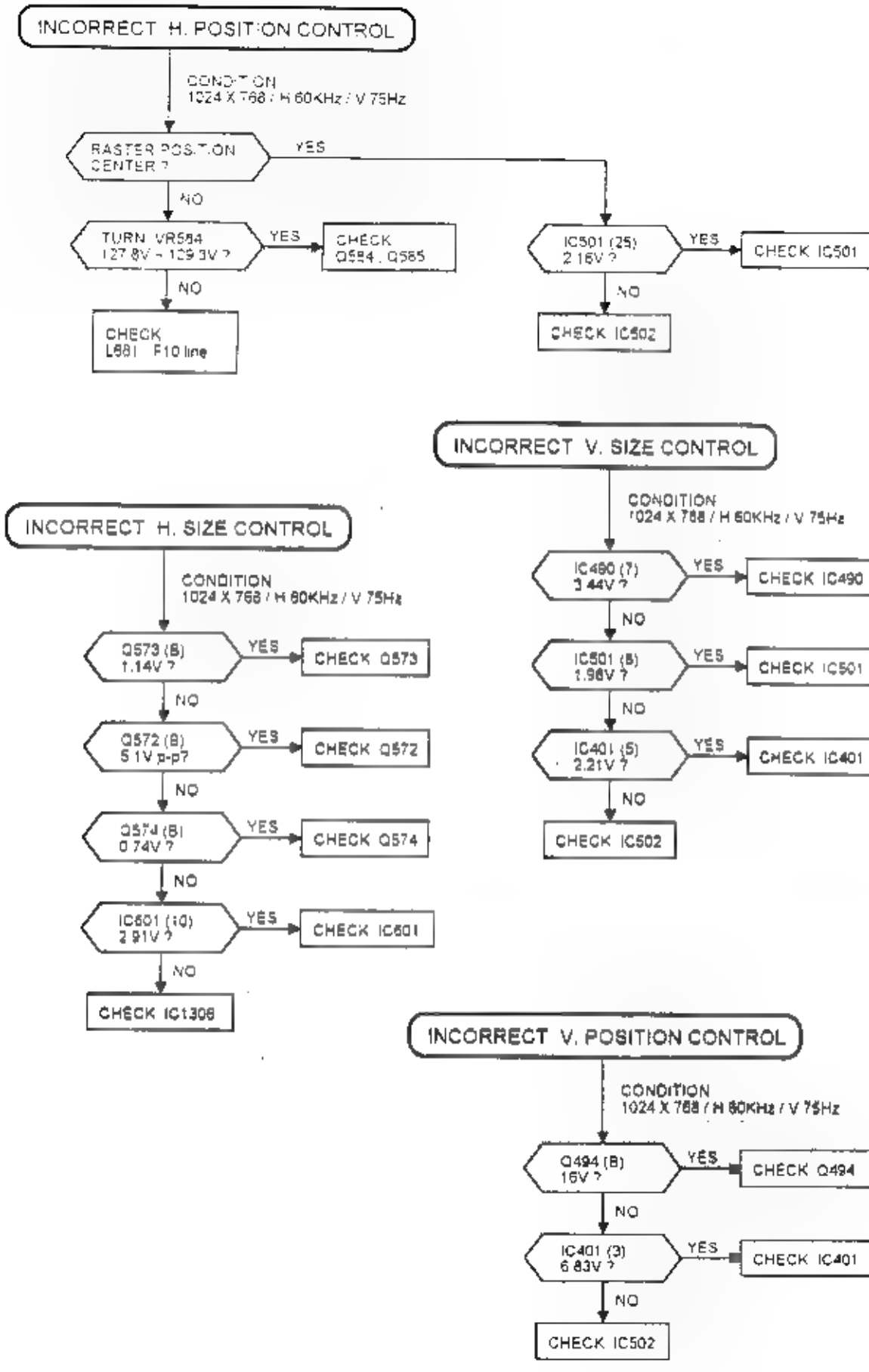

NO POWER
YES
C861(
183V ?
NO
T801 (1) '9) VOLTAGE
AT AC100V 93V
AT AC120V 106V
AT AC220V 200V
AT AC240V 220V
T801 (1)
YES
CHECK T801
NO

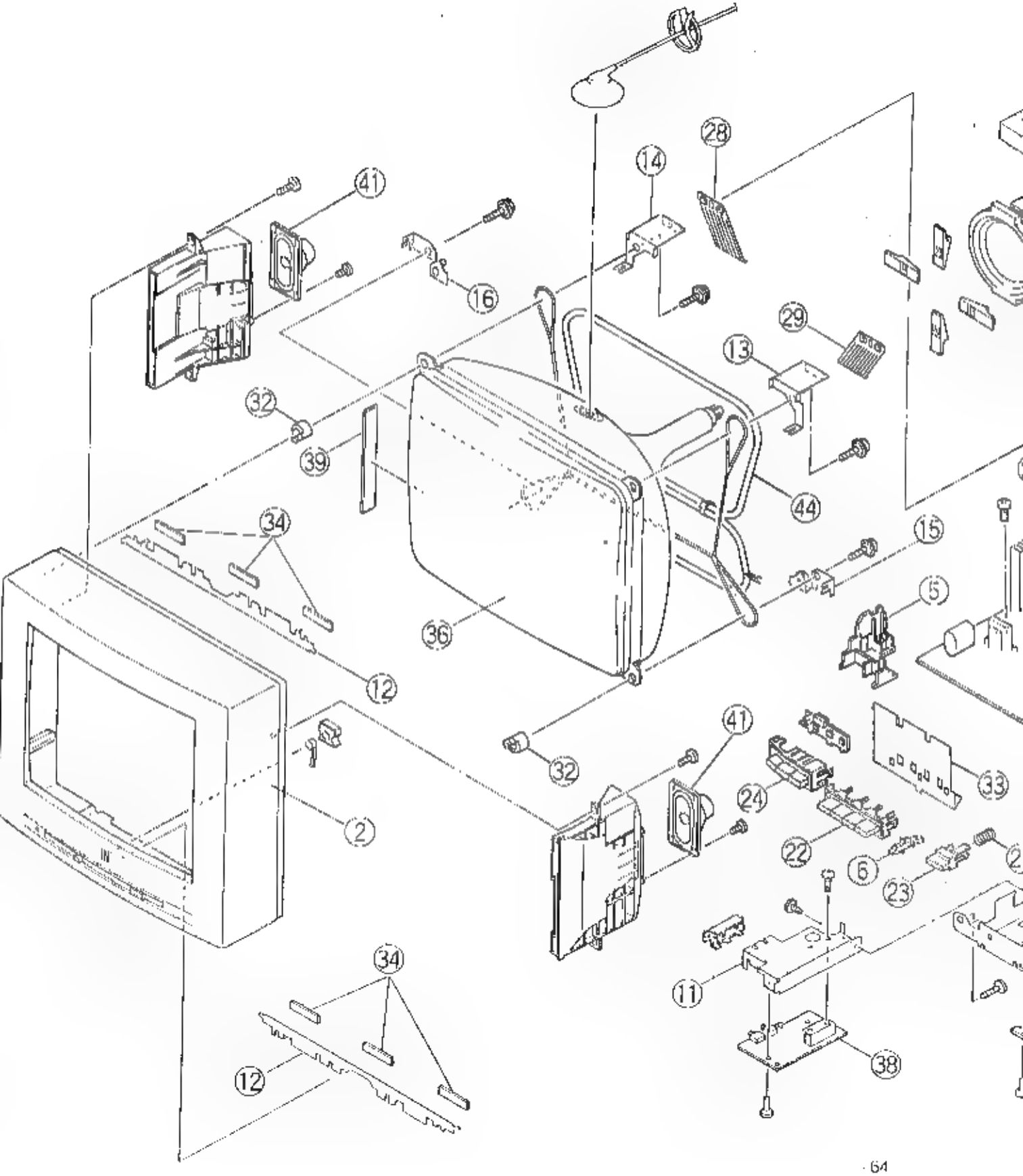

DEFECTIVE HORIZONTAL DEFLECTION CIRCUIT
CONDITION
1024 X 768 / H 60KHz / V 75Hz
NO RASTER
CHECK FBT , D554
DEFECTIVE H +B OUTPUT CIRCUIT
CHECK Q550
CHECK T541
CHECK Q549
CHECK IC502
CHECK IC503
CHECK IC501
CHECK 183V line
CHECK Q680
CHECK IC502
CHECK IC504
CHECK IC502
DEFECTIVE H. +B OUTPUT CIRCUIT
CONDITION
1024 X 768 / H 60KHz / V 75Hz
CHECK Q675 , Q676
CHECK Q674
CHECK Q672
CHECK IC901
CHECK Q682 , Q683
CHECK IC501
CHECK IC1306
CHECK IC660 , Q683 , ±12V line
YES
NO



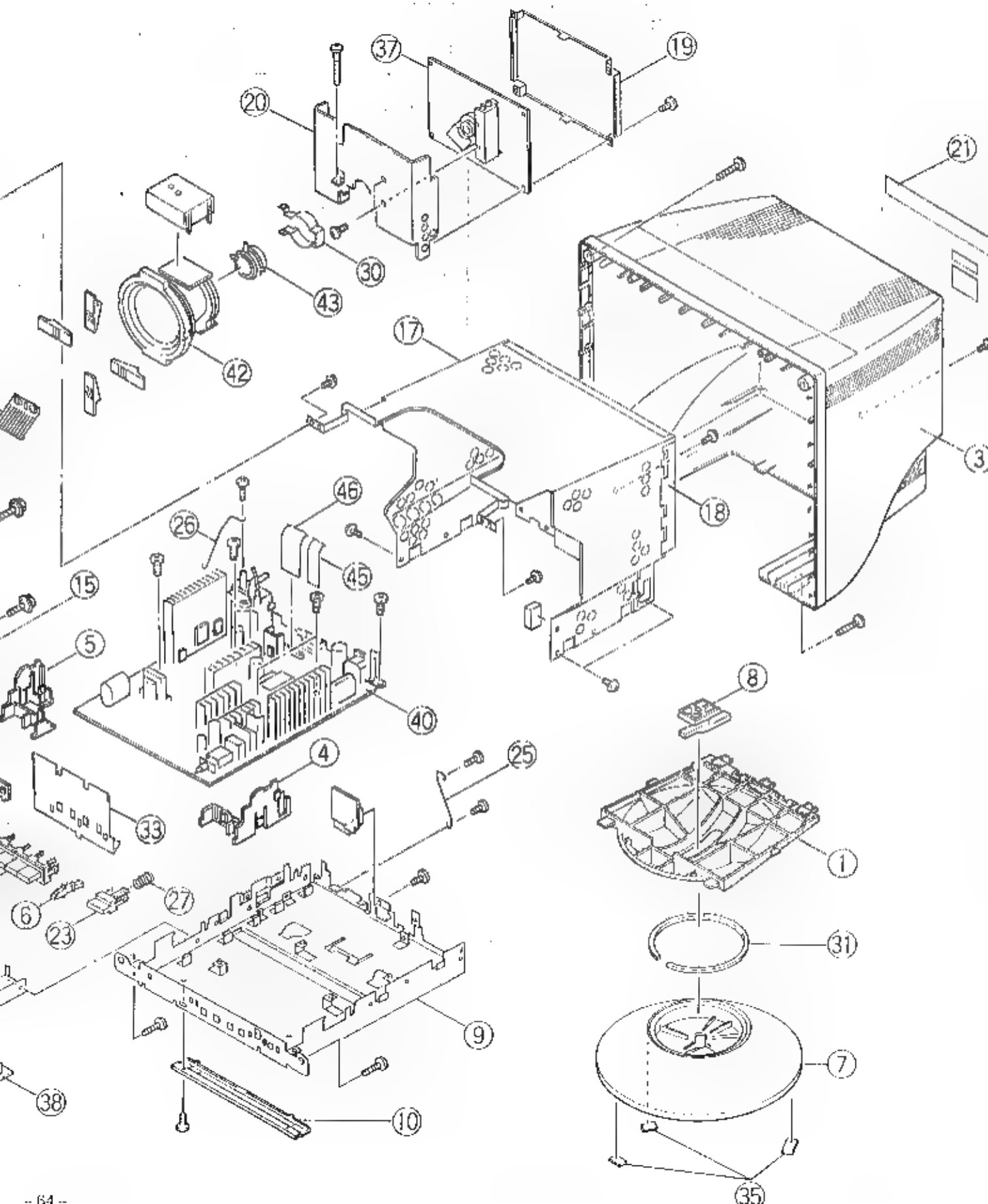
If no horizontal and/or vertical sync from PC, then the power save circuit becomes active.




INCORRECT H. POSITION CONTROL
CONDITION
1024 X 768 / H 60KHz / V 75Hz
RASTER POSITION CENTER ?
YES
NO
TURN VR584 127.8V ~ 129.3V ?
YES
CHECK Q584 , Q585
NO
CHECK L681 F10 line
IC501 (25) 2.16V ?
YES
CHECK IC501
NO
CHECK IC502
INCORRECT V. SIZE CONTROL
CONDITION
1024 X 768 / H 60KHz / V 75Hz
IC490 (7) 3.44V ?
YES
CHECK IC490
NO
IC501 (5) 1.98V ?
YES
CHECK IC501
NO
IC401 (5) 2.21V ?
YES
CHECK IC401
NO
CHECK IC502
INCORRECT H. SIZE CONTROL
CONDITION
1024 X 768 / H 60KHz / V 75Hz
Q573 (B) 1.14V ?
YES
CHECK Q573
NO
Q572 (B) 5.1V p-p?
YES
CHECK Q572
NO
Q574 (B) 0.74V ?
YES
CHECK Q574
NO
IC601 (10) 2.91V ?
YES
CHECK IC601
NO
CHECK IC1306
INCORRECT V. POSITION CONTROL
CONDITION
1024 X 768 / H 60KHz / V 75Hz
Q494 (B) 16V ?
YES
CHECK Q494
NO
IC401 (3) 6.83V ?
YES
CHECK IC401
NO
CHECK IC502


41
16
28
14
29
13
32
39
44
34
15
5
36
12
32
41
33
24
22
6
23
2
34
11
12
38

XPLODED VIEW



REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by the international symbol ⚠ have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

PESISTOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Carbon	F	± 1%
F	Fuse	J	± 5%
V	Meta Oxide	K	± 10%
S	Solid	M	± 20%
W	Wire Wound	G	± 2%

Example: ERD25TJ104 (C) 100K (J) 1/4W — Part No. / Description

CAPACITOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	C	± 0.25pF
E	Electrolytic	D	± 0.5pF
P	Polyester	F	± 1pF
S	Styro	J	± 5%
T	Tantalum	K	± 10%
PP	Polypropylene	L	± 15%
		V	± 20%
		P	+100% - 0%
		Z	+80% - 20%

Example: ECKF1H103ZF (C) 0.01μF (Z) 50 — Part No. / Description

Ref.No.	Part No.	Description
		CABINET & MAIN PARTS
⚠	1 TKY8595 11	BOTTOM CABINET
⚠	2 TTE8722401-1	ESCUTCHEON
⚠	3 TKJ894801	REAR COVER
	TKX400401	TILT COIL HOLDER
	4 TKX872101	CRT SUPPORTER(R)
	5 TKX872201	CRT SUPPORTER(L)
	6 TKK8593 15	LED GUIDE
	TKK859745	CONNECTOR COVER
	TKK859762	JACK PANEL
	7 TKK859979	PEDESTAL
	8 TKK859980	CENTER POST
	9 TUX86 194	BOTTOM PLATE
	10 TLX86195	BOTTOM PLATE BRACKET
	11 TUX87723	AUDIO PCB BRACKET
	12 TSA43001	RADIATOR
	13 TUC86980	EARTH METAL(R-UPPER)
	14 TUC86981	EARTH METAL(L-UPPER)
	15 TUC86982	EARTH METAL(R-UNDER)
	16 TUC86983	EARTH METAL(L-UNDER)
	17 TUC86984	SHIELD CASE
	18 TUC86985	SHIELD CASE(REAR)
	TUC87308	EARTH METAL(D-SUB)
	19 TUC87579	SHIELD CASE(CRT PCB)
	20 TUC87580	SHIELD PLATE(CRT PCB)
⚠	21 TBMC039	MODEL PLATE<-M>
⚠	21 TBMC040	MODEL PLATE<-E>
⚠	21 TBMC041	MODEL PLATE<-A>
	22 TBX8752301	KNOB(CONTROL)
	23 TBX8752501	KNOB(POWER SWITCH)
	24 TBX8753001	KNOB(AUDIO)
	25 TES8365	FBT SPRING
	26 TES8366	FBT SPRING(HOOK)
	TES9148-3	SPRING(CRT EARTH)
	27 TES9296	SPRING(POWER SWITCH)
	28 TES9529	CRT SPRING(R-UPPER)
	29 TES9530	CRT SPRING(L-UPPER)
	30 TES9531	CRT PCB HOLDER
	31 TMM15404-1	SPACER RING
	TMM15414	CLAMPER(SMALL)
	TMM6428-1	LEAD CLAMPER
	TMM7484	LEAD CLAMPER(SMALL)
	TMM7488	CLAMPER
	32 TMM85576-1	CRT RUBBER
	TMM85586	RUBBER(WEDGE)
	TMM85597	MICROPHONE RUBBER
	33 TMK8003	BUTTON SPACER
	34 TMKG001	RUBBER(FOR RADIATOR)
	TMKG003	RUBBER(FOR SHIELD CASE)
	35 TMK84990	SET LEG
	TMK85572	FERRITE STICK
	TMK87711	MICROPHONE SPONGE
	THEC0019	SCREW(FOR CRT PCB HOLDE
	THT1027	SCREW(FOR CRT)
	THT1089	SCREW(FOR SHIELD CASE)
	XTB4+12J	SCREW
	XTB5+16A	SCREW
	XTN5+16A	SCREW
	XTV3+10A	SCREW
	XTV3+6J	SCREW
	XYA4+5F8	SCREW
	XYE3+EJ10	SCREW
⚠	36 M41KXH140X-W	PICTURE TUBE
	37 TNP800970-22	PC BOARD W/COMPONENT(CR
	38 TNP800974-21	PC BOARD W/COMPONENT (AUDIO/CONTROL/TERMINA
	39 TNP800975-24	PC BOARD W/COMPONENT(TO
⚠	40 TNP800525-24	PC BOARD W/COMPONENT (MAIN)
	41 EAG903A	DOME SPEAKER
⚠	42 MEV41GHD	DEFLECTION YOKE
	43 ETC33D53NC	CONVERGENCE COIL

Ref.No	Part No.	Description
	TLK5880057	TILT COIL
	TLK6590987	DEGAUSS COIL
	TMQS0870	MICROPHONE
	TSXF005	AUDIO CORD
	TSXF006	MICROPHONE CORD
	TSX4515-1	SIGNAL CORD
	TSX8436-1	POWER CORD<-A,-E>
	TSX9416	POWER CORD<-M>
	TSX9809	FLAT CORD(10P)
	TSX9810	FLAT CORD(22P)
	TUT5999	HEXAGON POST
	TSXX007	2P/3P CONNECTOR ASSY
	TSXX008	2P CONNECTOR ASSY
	TSXX009	1P TERMINAL ASSY
	TSXX010	2P CONNECTOR ASSY
	TXAUTC2P750	2P CONNECTOR ASSY
	TXAUTC4P825	4P CONNECTOR ASSY
	TXAUTC5P482	5P CONNECTOR ASSY
	TXAUTC5P483	5P CONNECTOR ASSY
	TXAUTC6P580	6P CONNECTOR ASSY
	TXA3417333NMF	CRT EARTH LEAD
	TSM5511	MAGNET
	T4F31519Q	POLYESTER TAPE(20M)
	T4F72425Q	COTTON TAPE(25M)
	T4F90240	MAIRA TAPE
	TPCA02201	OUTER CARTON
	TXAP01D1733F	FILLER
	TPES14109-2	SET COVER
	TQES513-2	FUN BAG COVER
⚠	TQBE0010	INSTRUCTION BOOK
	TQF80720	NHW LABEL
	TQF82880	HIGH VOLTAGE LABEL
	TQF83825-6	SERIAL NO. LABEL
	TQF85363-1	CARTON LABEL<-M>
	TQF85363-5	CARTON LABEL<-A>
	TQF85363-8	CARTON LABEL<-E>
	TQF86553	PTB LABEL(INNER)
	TQF86974	US PATENTS LABEL
⚠	TQF86808	EARTH CAUTION LABEL
	TQF88821	BAR CODE LABEL
	I.C	
IC101	LM324MX	IC
IC201	M5234GSP	IC
IC280	Q4LC21TISN	IC
IC302	TDA8145	IC
IC351	LM358MX	IC
IC401	LM358MX	IC
IC490	TDA9302H	IC
IC501	UPC1883	IC
IC502	M5S3468PFTF	IC
IC503	AN78L09M-E1	IC
IC504	LM358MX	IC
IC550	AN6531	IC
IC601	LM324MX	IC
IC630	TVS1103	IC
IC751	M5S3468PFTF	IC
IC820	STR-56533	HYBRID IC
IC870	M5F7824L	IC
IC871	SI-3120FALF	IC
IC873	SI-3240CA	HYBRID IC
IC875	SI-3120FALF	IC
IC876	L78L05C-MA	IC
IC877	SI-3025F	HYBRID IC
IC901	TVC80219-1E	IC
IC902	TVR8AJ023	IC
IC1301	M5223GSP	IC
IC1302	EY07PYZ	HYBRID IC
IC1303	LM324MX	IC
IC1304	LM2931CMX	IC
IC1305	LSC4330	IC
IC1306	M5S3468PFTF	IC
IC1307	L78M05T	IC
IC1308	MM74HC4066MX	IC
IC2401	LA4270	IC
IC2402	CXA1279AS	IC
	TRANSISTORS	
Q11	2SK1470TD	TRANSISTOR
Q12	2SD602R	TRANSISTOR
Q13	2SC4080DETD	TRANSISTOR
Q14	2SC4080DETD	TRANSISTOR
Q15	2SA1575DETD	TRANSISTOR
Q101	2SD1994AR	TRANSISTOR
Q102	2SB1322AR	TRANSISTOR
Q103	2SD1994AR	TRANSISTOR
Q104	2SB1322AR	TRANSISTOR
Q250	XDC114EU	TRANSISTOR
Q251	XDA114EU	TRANSISTOR
Q252	XDC114EU	TRANSISTOR
Q303	2SC4081R	TRANSISTOR
Q307	2SC3938R	TRANSISTOR
Q308	XDC114EU	TRANSISTOR
Q309	2SC3938R	TRANSISTOR
Q319	2SC4620V2S	TRANSISTOR
Q331	2SA1018O	TRANSISTOR
Q333	XDC114EJ	TRANSISTOR
Q334	XDC114EJ	TRANSISTOR
Q401	XDC114EU	TRANSISTOR
Q494	2SD1994AQ	TRANSISTOR
Q495	2SB1220R	TRANSISTOR
Q501	XDC114EU	TRANSISTOR
Q549	2SK2015Z	TRANSISTOR
Q550	2SC5243002FD	TRANSISTOR
Q560	XDC114EU	TRANSISTOR
Q561	2SK2161YB	TRANSISTOR
Q562	XDC114EU	TRANSISTOR
Q563	2SK2161YB	TRANSISTOR
Q568	XDC114EU	TRANSISTOR
Q569	XDC114EU	TRANSISTOR
Q572	2SB1220R	TRANSISTOR
Q573	2SD1273PLB	TRANSISTOR
Q574	2SD1824R	TRANSISTOR
Q575	2SB792AR	TRANSISTOR
Q584	2SD2005R	TRANSISTOR
Q585	2SB1413R	TRANSISTOR
Q602	XDC114EU	TRANSISTOR
Q672	2SC3938R	TRANSISTOR
Q673	XDC114EU	TRANSISTOR
Q674	2SC4212-Y	TRANSISTOR
Q675	2SD1664Q	TRANSISTOR
Q676	2SB1132Q	TRANSISTOR
Q680	IRFI634G	TRANSISTOR
Q682	XDC114EU	TRANSISTOR

Ref.No.	Part No.	Description
Q883	XDC114EJ	TRANSISTOR
Q80*	2SB1414R	TRANSISTOR
Q802	2SC1473QNC	TRANSISTOR
Q803	2SD1819AR	TRANSISTOR
Q804	2SC3933R	TRANSISTOR
Q811	XDC114EL	TRANSISTOR
Q812	XDC114EL	TRANSISTOR
Q813	XDC114EL	TRANSISTOR
Q814	XDC114EL	TRANSISTOR
Q815	XDC114EL	TRANSISTOR
Q820	2SC4620VZB	TRANSISTOR
Q822	2SC1473AR	TRANSISTOR
Q823	XDC114EL	TRANSISTOR
Q824	2SD1820AR	TRANSISTOR
Q825	2SB1220R	TRANSISTOR
Q881	XDA114EL	TRANSISTOR
Q901	XDA114EL	TRANSISTOR
Q903	XDC114EU	TRANSISTOR
Q904	XDA114EU	TRANSISTOR
Q*001	2SC3811R	TRANSISTOR
Q*002	2SC3811R	TRANSISTOR
Q1101	2SC3811R	TRANSISTOR
Q1102	2SC3811R	TRANSISTOR
Q1201	2SC3811R	TRANSISTOR
Q1202	2SC3811R	TRANSISTOR
Q1301	XDC114EJ	TRANSISTOR
Q1302	XDC114EU	TRANSISTOR
Q1303	2SC3933R	TRANSISTOR
Q1304	XDC114EU	TRANSISTOR
	DIODES	
D11	MA153A	DIODE
D12	MA3150M	DIODE
D13	MA174	DIODE
D201	1SS353	DIODE
D205	DTZTT115R6B	DIODE
D207	DTZTT115R1B	DIODE
D280	DTZTT115R6B	DIODE
D281	DTZTT115R6B	DIODE
D282	DTZTT115R6B	DIODE
D283	DTZTT115R6B	DIODE
D302	DTZTT119R1C	DIODE
D303	EL02ZW	DIODE
D304	EU02ZW	DIODE
D305	1SS353	DIODE
D306	1SS353	DIODE
D307	1SS353	DIODE
D308	1SS353	DIODE
D330	HZT33-09TD	DIODE
D331	HZT33-09TD	DIODE
D381	TAX125X103MA	VARISTOR
D382	ERZC05DK201U	VARISTOR
D383	EU02Z	DIODE
D401	EU02	DIODE
D402	MA710D4	DIODE
D404	MA118QL	DIODE
D405	1SS353	DIODE
D409	DTZTT11368	DIODE
D497	MA3DWA	DIODE
D501	1SS353	DIODE
D505	DTZTT116R2B	DIODE
D507	DTZTT114R7B	DIODE

Ref.No.	Part No.	Description
D550	1SS353	DIODE
D551	ERA81004	DIODE
D552	RP3F014-302	DIODE
D555	PMP-3FU	DIODE
D556	MA3DWA	DIODE
D558	DTZTT1115C	DIODE
D560	TVSRG2A	DIODE
D561	EU02A	DIODE
D562	ERC30-02	DIODE
D563	ERC30-02	DIODE
D564	EU02A	DIODE
D601	ERA34-10	DIODE
D602	ERA34-10	DIODE
D603	1SS353	DIODE
D604	EJ02	DIODE
D605	1SS353	DIODE
D608	MA167	DIODE
D661	DTZTT1115C	DIODE
D667	1SS353	DIODE
D668	1SS353	DIODE
D669	1SS353	DIODE
D672	1SS353	DIODE
D674	ERA18-04	DIODE
D680	DTZTT1115C	DIODE
D681	CB903-4	DIODE
D682	DTZTT117R5C	DIODE
⚠ D801	ERZVEAV431	VARISTOR
⚠ D803	ERZVEAV431	VARISTOR
D807	EG01Z	DIODE
D808	RBV406M	DIODE
D809	1SS353	DIODE
D810	DTZTT11248	DIODE
D817	DTZTT1118B	DIODE
D821	ERA34-10	DIODE
D840	ERB83-02	DIODE
D841	TVSRG2A	DIODE
D842	ERC3808	DIODE
D843	TVSRG2	DIODE
D844	RL4Z	DIODE
D845	ERC30-02	DIODE
D847	DTZTT1124A	DIODE
D848	EM01Z	DIODE
D850	TVSRG2A	DIODE
D852	DTZTT118R8A	DIODE
D871	DTZTT1118B	DIODE
D879	DTZTT11156	DIODE
D891	TA10-8000	DIODE
D894	ERB8408	DIODE
D902	DTZTT115R1B	DIODE
D904	RB706F4D	DIODE
D905	DTZTT115R6B	DIODE
D907	DTZTT115R6B	DIODE
D912	MTZJ5R6B	DIODE
D913	DTZTT115R6B	DIODE
D914	DTZTT115R6B	DIODE
D915	DTZTT115R6B	DIODE
D940	SML1816W	DIODE(LED)
D941	LN417YP	DIODE(LED)
D946	MA142WK	DIODE
D947	DTZTT115R6B	DIODE
D948	DTZTT115R6B	DIODE
D950	DTZTT115R6B	DIODE

Ref.No.	Part No.	Description
D951	DTZTT115R6B	DIODE
D960	DTZTT115R6B	DIODE
D961	DTZTT115R6B	DIODE
D962	DTZTT115R6B	DIODE
D963	DTZTT115R6B	DIODE
D1001	1SS353	DIODE
D1002	1SS353	DIODE
D1008	MA142WK	DIODE
D1101	1SS353	DIODE
D1102	1SS353	DIODE
D1109	MA142WK	DIODE
D1201	1SS353	DIODE
D1202	1SS353	DIODE
D1208	MA142WK	DIODE
D1302	MA29TA	DIODE
D1303	DTZTT115R6B	DIODE
D1304	DTZTT115R6B	DIODE
D1305	DTZTT115R6B	DIODE
D1306	DTZTT115R6B	DIODE
D1307	DTZTT115R6B	DIODE
D1311	DTZTT115R6B	DIODE
D1401	1SS353	DIODE
D1402	1SS353	DIODE
D2401	MA709TA	DIODE
D2402	DTZTT115C	DIODE
D2403	DTZTT119R1B	DIODE
D2404	DTZTT119R1B	DIODE
	COIL & TRANSFORMERS	
L381	TSK8029	FERRITE CORE
L383	TSK8029	FERRITE CORE
L521	ELEV470KA	PEAKING COIL
L581	TLUACNB2R2M	PEAKING COIL
L570	ELCD8D0960	CHOKE COIL
L573	TLHE001	COIL
L575	TLH858157	COIL
L578	TLH858192	COIL
L681	TLPB5709R	CHOKE COIL
⚠ L801	ELF18D656J	LINE FILTER
⚠ L802	ELF18D656J	LINE FILTER
L805	TSK8031	FERRITE CORE
L821	EXCELDR35C	LC COMBINATION
L822	EXCELDR35C	LC COMBINATION
L823	EXCELDR35C	LC COMBINATION
L840	EXCELDR35C	LC COMBINATION
L844	EXCELDR35C	LC COMBINATION
L845	EXCELDR35C	LC COMBINATION
L851	EXCELDR35C	LC COMBINATION
L852	EXCELDR35C	LC COMBINATION
L853	EXCELDR35C	LC COMBINATION
L1002	ELEXHR33KA	PEAKING COIL
L1101	ELEXHR22KA	PEAKING COIL
L1102	ELEXHR33KA	PEAKING COIL
L1202	ELEXHR33KA	PEAKING COIL
L1301	ELEXH100KA	PEAKING COIL
L1302	TLUACNB821K	PEAKING COIL
L1303	TSK8029	FERRITE CORE
L1307	ELJFA100KB	CHIP COIL
L1308	ELEXH151KA	PEAKING COIL
L2001	TSKX006	FERRITE CORE
L2002	TSKX006	FERRITE CORE

Ref.No.	Part No.	Description			
L2301	EXCELDR35C	LC COMBINATION			
T351	TLH859062	TRANSFORMER			
T541	ETS22AE119AC	TRANSFORMER			
⚠ T601	ETF29L86AZ	FLYBACK TRANSFORMER			
⚠ T801	TLPB5233R1	TRANSFORMER			
	CONTROL				
VR584	EVMEGSA00B13	CONTROL B		1K	OHM
VR801	EVMEGSA00B23	CONTROL B		2K	OHM
	CAPACITORS				
C11	ECUX1C228ZFW	C	2.2UF	Z	16V
C12	ECUX1C334KBW	C	0.33UF	K	16V
C13	ECUX1H104ZFX	C	0.1UF	Z	50V
C14	ECUX1H104ZFX	C	0.1UF	Z	50V
C16	ECUX1H681KBN	C	680PF	K	50V
C17	TAC1022Z104H	C	0.1UF	K	200V
C101	ECUX1H103KBG	C	0.01UF	K	50V
C106	ECUX1E334ZFW	C	0.33UF	Z	25V
C107	ECEA1HGE4R7	E	4.7UF		50V
C108	ECEA1HGE4R7	E	4.7UF		50V
C112	ECUX1E334ZFW	C	0.33UF	Z	25V
C201	ECQV1H474JM	P	0.47UF	J	50V
C202	ECEA1HGE010	E	1UF		50V
C203	ECEA1HGE010	E	1UF		50V
C204	ECUX1H472KBG	C	4700PF	K	50V
C205	ECUX1H103KBG	C	0.01UF	K	50V
C208	ECUX1H103KBG	C	0.01UF	K	50V
C207	ECEA1HGE2R2	E	2.2UF		50V
C208	ECEA1HGER47	E	0.47UF		50V
C209	ECUX1H333KBX	C	0.033UF	K	50V
C210	ECUX1H102KBN	C	1000PF	K	50V
C211	ECUX1H102KBN	C	1000PF	K	50V
C212	ECEA1CGE101	E	100UF		16V
C213	ECUX1H102KBN	C	1000PF	K	50V
C214	ECQV1H474JM	P	0.47UF	J	50V
C215	ECEA1CGE101	E	100UF		16V
C250	ECUX1H103KBG	C	0.01UF	K	50V
C305	ECUX1H221KBN	C	220PF	K	50V
C306	ECEA1HGE330	E	33UF		50V
C309	ECUX1H103KBG	C	0.01UF	K	50V
C316	ECKD2H151KB5	C	150PF	K	500V
C319	ECQV1H473JM	P	0.047UF	J	50V
C320	ECEA1HGE100	E	10UF		50V
C321	ECUX1H222JCX	C	2200PF	J	50V
C323	ECKD3A102JBP	B	1000PF	J	1KV
C326	ECEA1EGE100	E	10UF		25V
C328	ECUX1H103KBG	C	0.01UF	K	50V
C339	ECQE2473KF	P	0.047UF	K	200V
C372	ECEA1EGE330	E	33UF		25V
C375	ECUX1H103KBG	C	0.01UF	K	50V
C378	ECUX1H103KBG	C	0.01UF	K	50V
C377	ECEA1EGE100	E	10UF		25V
C378	ECEA1VGE101	E	100UF		35V
C381	ECQE2123JF	P	0.012UF	J	200V
C382	ECQE2124JF	P	0.12UF	J	200V
C383	ECQE2103JF	P	0.01UF	J	200V
C385	ECQV1H105JM	P	1.0UF	J	50V
C386	ECQE2103JF	P	0.01UF	J	200V
C393	ECKD3D272KBP	B	2700PF	K	2KV
C394	TCUX2H101JCM	C	100PF	J	500V
C401	ECEA1HGE010	E	1UF		50V

Ref No.	Part No.		Description		
C402	ECUX1H103KBG	C	0.01UF	K	50V
C403	ECUX1H103KBG	C	0.01UF	K	50V
C404	ECUX1H103KBG	C	0.01UF	K	50V
C405	ECEA1CGE101	E	100UF		16V
C406	ECEA1CGE470	E	47UF		16V
C407	ECEA1EGE221	E	220UF		25V
C408	ECEA1HGE102	E	1000UF		50V
C409	ECQV1H224JM	P	0.22UF	J	50V
C410	ECEA1HGE100	E	10UF		50V
C412	ECEA1VGE222	E	2200UF		35V
C413	ECEA1EGE470	E	47UF		25V
C414	ECUX1H331KBN	C	330PF	K	50V
C415	ECUX1H682JCW	C	6800PF	J	50V
C417	ECQV1H334JM	P	0.33UF	J	50V
C418	ECUX1H104ZFX	C	0.1UF	Z	50V
C419	ECUX1H104ZFX	C	0.1UF	Z	50V
C421	ECUX1H683KBW	C	0.068UF	K	50V
C498	ECEA1VGE101	E	100UF		35V
C502	ECEA1CGE221	E	220UF		16V
C503	ECUX1H103KBG	C	0.01UF	K	50V
C504	ECEA1EGE100	E	10UF		25V
C505	ECUX1H102JCX	C	1000PF	J	50V
C506	ECUX1H681JCX	C	680PF	J	50V
C507	ECUX1H103KBG	C	0.01UF	K	50V
C508	ECUX1C225ZFW		2.2UF	Z	16V
C509	ECUX1H104ZFX	C	0.1UF	Z	50V
C511	ECUX1H104ZFX	C	0.1UF	Z	50V
C512	ECUX1H104ZFX		0.1UF	Z	50V
C513	ECUX1H102KBN	C	1000PF	K	50V
C514	ECUX1H104ZFX	C	0.1UF	Z	50V
C515	ECEA1CGN100	E	10UF		16V
C516	ECEA1HGE2R2	E	2.2UF		50V
C517	ECEA1CGE221	E	220UF		16V
C520	ECEA1EGE470	E	47UF		25V
C521	ECEA0JGE471	E	470UF		6.3V
C526	ECEA1HGE3R3	E	3.3UF		50V
C527	ECEA1HGE3R3	E	3.3UF		50V
C528	ECEA1CGE102	E	1000UF		16V
C550	ECEA1VGE101	E	100UF		35V
C551	ECEA1VGE470	E	47UF		35V
C552	ECKD2H332KB5	C	3300PF	K	500V
C555	ECKD3F561JBP	C	560PF	J	3KV
C556	TAC4RBT472HC	PP	4700PF	H	1.5KV
C561	TAC7A2G274JC	PP	0.27UF	J	400V
C562	TAC7A2G105JC	PP	1UF	J	400V
C563	TAC7A2G244JC	PP	0.24UF	J	400V
C565	TAC7A2G244JC	PP	0.24UF	J	400V
C566	ECUX1H473ZFM	C	0.047UF	Z	50V
C567	ECUX1H473ZFM	C	0.047UF	Z	50V
C570	ECKC3D821JBP	C	820PF	J	2KV
C571	ECQF6272JZ	PP	2700PF	J	600V
C572	ECQE1335KF	P	3.3UF	K	100V
C573	ECKD2H681KB5	C	680PF	K	500V
C574	ECKD2H332KB5	C	3300PF	K	500V
C576	ECUX1H103KBG	C	0.01UF	K	50V
C577	ECUX1H103KBG	C	0.01UF	K	50V
C579	ECUX1H222ZFN	C	2200PF	Z	50V
C580	ECEA1CGE470	E	47UF		16V
C581	ECQV1H684JM	P	0.68UF	J	50V
C582	ECUX1H103KBG	C	0.01UF	K	50V
C583	ECUX1C105ZFW	C	1.0UF	Z	16V
C585	ECUX1H103KBG	C	0.01UF	K	50V

Ref.No.	Part No		Description		
C590	ECUX1H102KBN	C	1000PF	K	50V
C601	ECEA2CGE2R2	E	2.2UF		160V
C602	ECQE2474JF	P	0.47UF	J	200V
C603	ECUX1H222KBN	C	2200PF	K	50V
C604	ECEA2AGE220	E	22UF		100V
C605	ECQE1G473MU	P	0.047UF	M	1KV
C606	ECEA1HGE010	E	1UF		50V
C607	ECUX1H102JCX	C	1000PF	J	50V
C608	ECKD2H102KB5	C	1000PF	K	500V
C609	ECKF1H682KB	C	6800PF	K	50V
C611	ECEA2EGE100	E	10UF		250V
C612	ECEA1EGE100	E	10UF		25V
C660	ECEA1CF560	E	56UF		16V
C661	ECUX1H102JCX	C	1000PF	J	50V
C664	ECKD2H272KB5	C	2700PF	K	500V
C665	ECUX1H121JCG	C	120PF	J	50V
C666	ECUX1H102JCX	C	1000PF	J	50V
C667	ECUX1H221JCG	C	220PF	J	50V
C671	ECUX1C105ZFW	C	1.0UF	Z	16V
C672	ECEA1HGE4R7	E	4.7UF		50V
C674	ECEA1VGE470	E	47UF		35V
C679	ECA1JFQ120	E	12UF		63V
C681	ECA2CGE221W	E	220UF		160V
C701	ECUX1H103KBG	C	0.01UF	K	50V
C702	ECUX1H103KBG	C	0.01UF	K	50V
C703	ECUX1H103KBG	C	0.01UF	K	50V
C704	ECUX1H103KBG	C	0.01UF	K	50V
C707	ECUX1H103KBG	C	0.01UF	K	50V
C709	ECEA1EGE101	E	100UF		25V
C711	ECUX1E563KBX	C	0.056UF		25V
C753	ECUX1H103KBG	C	0.01UF	K	50V
⚠ C801	ECQU2A105MVZ	PP	1.0UF	M	250V
⚠ C802	ECKDRS102KB		1000PF	K	
⚠ C803	ECKDRS102KB		1000PF	K	
⚠ C805	ECQU2A105MVZ	PP	1.0UF	M	250V
C814	TAC7A2G105JC	PP	1UF	J	400V
C815	ECQE4104JF	P	0.1UF	J	400V
C820	ECUX1H223KBX		0.022UF	K	50V
C821	ECQE2473KF	P	0.047UF	K	200V
C822	ECUX1H222KBN	C	2200PF	K	50V
C823	ECEA1HGE4R7	E	4.7UF		50V
C824	ECEA1HGE100	E	10UF		50V
C825	ECEA1HGN3R3	E	3.3UF		50V
C827	ECUX1H681KBN	C	680PF	K	50V
C828	ECEA1HGE470	E	47UF		50V
C829	ECEA1VGE221	E	220UF		35V
⚠ C832	ECKDRS102KB	C	1000PF	K	
⚠ C834	ECKDRS102KB	C	1000PF		
C839	ECEA0JGE331	E	330UF		6.3V
C840	ECEA1HGE4R7	E	4.7UF		50V
C842	ECKD3D151JBP	C	150PF	J	2KV
C844	ECA2CGE221W	E	220UF		160V
C853	ECEA1EGE100	E	10UF		25V
C854	ECQV1H224JM	P	0.22UF	J	50V
C861	ECOS2E681CA	E	680UF		250V
C862	ECA2CGE221W	E	220UF		160V
C863	ECEA1HGE102	E	1000UF		50V
C864	ECEA1EGE332	E	3300UF		25V
C865	ECA1EFQ102	E	1000UF		25V
C866	ECEA1CGE101	E	100UF		16V
C867	ECEA1VGE102	E	1000UF		35V
C868	ERQS2TCO	C	0 OHM		1/4W

Ref.No.	Part No.		Description		
C870	ECEA1HGE101	E	100UF		50V
C871	ECEA1EGE221	E	220UF		25V
C873	ECUX1H104ZFX	C	0.1UF	Z	50V
C874	ECUX1H104ZFX	C	0.1UF	Z	50V
C875	ECEA1EGE331	E	330UF		25V
C876	ECEA1HGE221	E	220UF		50V
C877	ECUX1H104ZFX	C	0.1UF	Z	50V
C879	ECEA1AGE101	E	100UF		10V
C880	TACCZ335P630	P	3.3UF	K	630V
C882	ECUX1H104ZFX	C	0.1UF	Z	50V
C896	ECQE6473KF	M	0.047UF	K	630V
C901	ECUX1H220JCN	C	22PF	J	50V
C902	ECEA1AGE101	E	100UF		10V
C903	ECUX1H103KBG	C	0.01UF	K	50V
C904	ECUX1H103KBG	C	0.01UF	K	50V
C905	ECEA1HGE010	E	1UF		50V
C906	ECUX1H103KBG	C	0.01UF	K	50V
C907	ECUX1H221KBN	C	220PF	K	50V
C908	ECUX1H150JCN	C	15PF	J	50V
C909	ECUX1H150JCN	C	15PF	J	50V
C910	ECUX1H221KBN	C	220PF	K	50V
C911	ECUX1H221KBN	C	220PF	K	50V
C912	ECUX1H333KBX	C	0.033UF	K	50V
C1001	ECEA1EGE100	E	10UF		25V
C1002	ECEA1CGE470	E	47UF		16V
C1003	ECUX1H103KBG	C	0.01UF	K	50V
C1004	ECUX1H103KBG	C	0.01UF	K	50V
C1005	ECQV1H105JM	P	1.0UF	J	50V
C1006	ECUX1H111JC	C	110PF	J	50V
C1008	ECEA2CGE220	E	22UF		160V
C1009	ECUX1H103KBG	C	0.01UF	K	50V
C1010	ECKD2H102KB5	B	1000PF	K	500V
C1013	ECUX1H560JCG	C	56PF	J	50V
C1030	ECUX1H220JCN	C	22PF	J	50V
C1101	ECEA1EGE100	E	10UF		25V
C1102	ECEA1CGE470	E	47UF		16V
C1103	ECUX1H103KBG	C	0.01UF	K	50V
C1104	ECUX1H103KBG	C	0.01UF	K	50V
C1105	ECQV1H105JM	P	1.0UF	J	50V
C1106	ECUX1H111JC	C	110PF	J	50V
C1109	ECUX1H103KBG	C	0.01UF	K	50V
C1110	ECKD2H102KB5	B	1000PF	K	500V
C1113	ECUX1H560JCG	C	56PF	J	50V
C1130	ECUX1H220JCN	C	22PF	J	50V
C1201	ECEA1EGE100	E	10UF		25V
C1202	ECEA1CGE470	E	47UF		16V
C1203	ECUX1H103KBG	C	0.01UF	K	50V
C1204	ECUX1H103KBG	C	0.01UF	K	50V
C1205	ECQV1H105JM	P	1.0UF	J	50V
C1206	ECUX1H121JCG	C	120PF	J	50V
C1207	ECEA2AGE2R2	E	2.2UF		100V
C1208	ECEA2AGE2R2	E	2.2UF		100V
C1209	ECUX1H103KBG	C	0.01UF	K	50V
C1210	ECKD2H102KB5	B	1000PF	K	500V
C1213	ECUX1H560JCG	C	56PF	J	50V
C1230	ECUX1H220JCN	C	22PF	J	50V
C1301	ECEA1HGE100	E	10UF		50V
C1302	ECUX1H103KBG	C	0.01UF	K	50V
C1303	ECEA1CGE101	E	100UF		16V
C1304	ECEA1CGE1C2	E	1000UF		16V
C1305	ECUX1H104ZFX	C	0.1UF	Z	50V
C1306	ECUX1C105ZFW	C	1.0UF	Z	16V
C1307	ECUX1H100DCN	C	10PF	D	50V
C1309	TACCG102P200	C	1000PF		200V
C1310	ECEA2CGE220	E	22UF		160V
C1311	ECUX1H103KBG	C	0.01UF	K	50V
C1312	ECUX1C105ZFW	C	1.0UF	Z	16V
C1314	ECEA1CGE470	E	47UF		16V
C1315	ECUX1H103KBG	C	0.01UF	K	50V
C1316	ECUX1H103KBG	C	0.01UF	K	50V
C1318	ECUX1H103KBG	C	0.01UF	K	50V
C1320	ECUX1H333KBX	C	0.033UF	K	50V
C1321	ECUX1H220JCN	C	22PF	J	50V
C1322	ECUX1H220JCN	C	22PF	J	50V
C1323	ECEA1AGE101	E	100UF		10V
C1324	ECUX1H220JCN	C	22PF	J	50V
C1325	ECEA1CGE101	E	100UF		16V
C1326	ECUX1H683KBW	C	0.068UF	K	50V
C1327	ECEA1HGE100	E	10UF		50V
C1328	ECUX1H101JCG	C	100PF	J	50V
C1329	ECUX1H103KBG	C	0.01UF	K	50V
C1410	ECUX1C105ZFW	C	1.0UF	Z	16V
C1411	ECUX1H682KBG	C	6800PF	K	50V
C2301	ECUX1H562KBG	C	5600PF	K	50V
C2302	ECUX1H562KBG	C	5600PF	K	50V
C2303	ECEA1EGE220	E	22UF		25V
C2304	ECEA1HGE010	E	1UF		50V
C2305	ECEA1CGE221	E	220UF		16V
C2306	ECEA1HGE010	E	1UF		50V
C2307	ECEA1EGE220	E	22UF		25V
C2308	ECEA1CGE471	E	470UF		16V
C2309	ECUX1H104ZFX	C	0.1UF	Z	50V
C2310	ECUX1H104ZFX	C	0.1UF	Z	50V
C2311	ECEA1CGE471	E	470UF		16V
C2312	ECEA1EGE222	E	2200UF		25V
C2401	ECEA1HGE2R2	E	2.2UF		50V
C2402	ECEA1HGE2R2	E	2.2UF		50V
C2403	ECUX1H223KBX	B	0.022UF	K	50V
C2404	ECEA1HGER22	E	0.22UF		50V
C2407	ECUX1H223KBX	C	0.022UF	K	50V
C2408	ECEA1HGER22	E	0.22UF		50V
C2409	ECEA1EGE100	E	10UF		25V
C2410	ECEA1EGE220	E	22UF		25V
C2411	ECEA1HGE010	E	1UF		50V
C2412	ECEA1CGE221	E	220UF		16V
C2413	ECEA1CGE470	E	47UF		16V
C2414	ECEA1HGN010	E	1UF		50V
C2416	ECUX1H103KBG	C	0.01UF	K	50V

RESISTORS

D941	ERJ6GEYJ221	M	220 OHM	J	1/10W
J11	ERJ8GCY0R00	M	0 OHM		1/8W
J11	ERJ6GEY0R00	M	0 OHM		1/10W
J009	ERDS2TC0	C	0 OHM		1/4W
J010	ERDS2TC0	C	0 OHM		1/4W
J011	ERDS2TC0	C	0 OHM		1/4W
J012	ERDS2TC0	C	0 OHM		1/4W
J014	ERDS2TC0	C	0 OHM		1/4W
J015	ERDS2TC0	C	0 OHM		1/4W
J016	ERDS2TC0	C	0 OHM		1/4W
J018	ERDS2TC0	C	0 OHM		1/4W
J022	ERDS2TC0	C	0 OHM		1/4W
J023	ERDS2TC0	C	0 OHM		1/4W
J025	ERDS2TC0	C	0 OHM		1/4W

Ref.No.	Part No.		Description		Ref.No.	Part No.		Description	
J102	ERD25TCO	C	0 OHM	1/4W	J331	ERD25TCO	C	0 OHM	1/4W
J103	ERD25TCO	C	0 OHM	1/4W	J333	ERD25TCO	C	0 OHM	1/4W
J104	ERD25TCO	C	0 OHM	1/4W	J334	ERD25TCO	C	0 OHM	1/4W
J105	ERD25TCO	C	0 OHM	1/4W	J335	ERD25TCO	C	0 OHM	1/4W
J106	ERD25TCO	C	0 OHM	1/4W	J336	ERD25TCO	C	0 OHM	1/4W
J114	ERD25TCO	C	0 OHM	1/4W	J338	ERD25TCO	C	0 OHM	1/4W
J201	ERD25TCO	C	0 OHM	1/4W	J339	ERD25TCO	C	0 OHM	1/4W
J202	ERD25TCO	C	0 OHM	1/4W	J340	ERD25TCO	C	0 OHM	1/4W
J203	ERD25TCO	C	0 OHM	1/4W	J401	ERJ6GEYOR00	M	0 OHM	1/10W
J206	ERD25TCO	C	0 OHM	1/4W	J402	ERJ6GEYOR00	M	0 OHM	1/10W
J207	ERD25TCO	C	0 OHM	1/4W	J403	ERJ6GEYOR00	M	0 OHM	1/10W
J208	ERD25TCO	C	0 OHM	1/4W	J404	ERJ6GEYOR00	M	0 OHM	1/10W
J209	ERD25TCO	C	0 OHM	1/4W	J405	ERJ6GEYOR00	M	0 OHM	1/10W
J210	ERD25TCO	C	0 OHM	1/4W	J406	ERJ6GEYOR00	M	0 OHM	1/10W
J211	ERD25TCO	C	0 OHM	1/4W	J407	ERJ6GEYOR00	M	0 OHM	1/10W
J217	ERD25TCO	C	0 OHM	1/4W	J408	ERJ6GEYOR00	M	0 OHM	1/10W
J218	ERD25TCO	C	0 OHM	1/4W	J409	ERJ6GEYOR00	M	0 OHM	1/10W
J221	ERD25TCO	C	0 OHM	1/4W	J410	ERJ6GEYOR00	M	0 OHM	1/10W
J222	ERD25TCO	C	0 OHM	1/4W	J411	ERJ6GEYOR00	M	0 OHM	1/10W
J223	ERD25TCO	C	0 OHM	1/4W	J412	ERJ6GEYOR00	M	0 OHM	1/10W
J224	ERD25TCO	C	0 OHM	1/4W	J414	ERJ6GEYOR00	M	0 OHM	1/10W
J225	ERD25TCO	C	0 OHM	1/4W	J415	ERJ6GEYOR00	M	0 OHM	1/10W
J226	ERD25TCO	C	0 OHM	1/4W	J416	ERJ6GEYOR00	M	0 OHM	1/10W
J227	ERD25TCO	C	0 OHM	1/4W	J418	ERJ6GEYOR00	M	0 OHM	1/10W
J228	ERD25TCO	C	0 OHM	1/4W	J419	ERJ6GEYOR00	M	0 OHM	1/10W
J229	ERD25TCO	C	0 OHM	1/4W	J422	ERJ6GEYOR00	M	0 OHM	1/10W
J232	ERD25TCO	C	0 OHM	1/4W	J424	ERJ6GEYOR00	M	0 OHM	1/10W
J235	ERD25TCO	C	0 OHM	1/4W	J425	ERJ6GEYOR00	M	0 OHM	1/10W
J236	ERD25TCO	C	0 OHM	1/4W	J426	ERJ6GEYOR00	M	0 OHM	1/10W
J237	ERD25TCO	C	0 OHM	1/4W	J429	ERJ6GEYOR00	M	0 OHM	1/10W
J239	ERD25TCO	C	0 OHM	1/4W	J431	ERJ6GEYOR00	M	0 OHM	1/10W
J240	ERD25TCO	C	0 OHM	1/4W	J432	ERJ6GEYOR00	M	0 OHM	1/10W
J242	ERD25TCO	C	0 OHM	1/4W	J434	ERJ6GEYOR00	M	0 OHM	1/10W
J243	ERD25TCO	C	0 OHM	1/4W	J435	ERJ6GEYOR00	M	0 OHM	1/10W
J244	ERD25TCO	C	0 OHM	1/4W	J436	ERJ6GEYOR00	M	0 OHM	1/10W
J245	ERD25TCO	C	0 OHM	1/4W	J437	ERJ6GEYOR00	M	0 OHM	1/10W
J246	ERD25TCO	C	0 OHM	1/4W	J440	ERJ6GEYOR00	M	0 OHM	1/10W
J247	ERD25TCO	C	0 OHM	1/4W	J441	ERJ6GEYOR00	M	0 OHM	1/10W
J249	ERD25TCO	C	0 OHM	1/4W	J442	ERJ6GEYOR00	M	0 OHM	1/10W
J250	ERD25TCO	C	0 OHM	1/4W	J501	ERJ8GCYOR00	M	0 OHM	1/8W
J251	ERD25TCO	C	0 OHM	1/4W	J502	ERJ8GCYOR00	M	0 OHM	1/8W
J252	ERD25TCO	C	0 OHM	1/4W	J503	ERJ8GCYOR00	M	0 OHM	1/8W
J253	ERD25TCO	C	0 OHM	1/4W	J504	ERJ8GCYOR00	M	0 OHM	1/8W
J254	ERD25TCO	C	0 OHM	1/4W	J505	ERJ8GCYOR00	M	0 OHM	1/8W
J257	ERD25TCO	C	0 OHM	1/4W	J506	ERJ8GCYOR00	M	0 OHM	1/8W
J258	ERD25TCO	C	0 OHM	1/4W	J507	ERJ8GCYOR00	M	0 OHM	1/8W
J304	ERD25TCO	C	0 OHM	1/4W	J508	ERJ8GCYOR00	M	0 OHM	1/8W
J305	ERD25TCO	C	0 OHM	1/4W	J509	ERJ8GCYOR00	M	0 OHM	1/8W
J306	ERD25TCO	C	0 OHM	1/4W	J510	ERJ8GCYOR00	M	0 OHM	1/8W
J307	ERD25TCO	C	0 OHM	1/4W	J511	ERJ8GCYOR00	M	0 OHM	1/8W
J308	ERD25TCO	C	0 OHM	1/4W	J512	ERJ8GCYOR00	M	0 OHM	1/8W
J309	ERD25TCO	C	0 OHM	1/4W	J513	ERJ8GCYOR00	M	0 OHM	1/8W
J311	ERD25TCO	C	0 OHM	1/4W	J514	ERJ8GCYOR00	M	0 OHM	1/8W
J316	ERD25TCO	C	0 OHM	1/4W	J515	ERJ8GCYOR00	M	0 OHM	1/8W
J318	ERD25TCO	C	0 OHM	1/4W	J516	ERJ8GCYOR00	M	0 OHM	1/8W
J321	ERD25TCO	C	0 OHM	1/4W	J517	ERJ8GCYOR00	M	0 OHM	1/8W
J323	ERD25TCO	C	0 OHM	1/4W	J518	ERJ8GCYOR00	M	0 OHM	1/8W
J324	ERD25TCO	C	0 OHM	1/4W	J519	ERJ8GCYOR00	M	0 OHM	1/8W
J326	ERD25TCO	C	0 OHM	1/4W	J520	ERJ8GCYOR00	M	0 OHM	1/8W
J328	ERD25TCO	C	0 OHM	1/4W	J521	ERJ8GCYOR00	M	0 OHM	1/8W
J329	ERD25TCO	C	0 OHM	1/4W	J522	ERJ8GCYOR00	M	0 OHM	1/8W
J330	ERD25TCO	C	0 OHM	1/4W	J523	ERJ8GCYOR00	M	0 OHM	1/8W

Ref.No.	Part No.		Description			Ref.No.	Part No.		Description		
J524	ERJ8GCY0R00	M	0 OHM		1/8W	J2052	ERJ8GCY0R00	M	0 OHM		1/8W
J525	ERJ8GCY0R00	M	0 OHM		1/8W	J2053	ERJ8GCY0R00	M	0 OHM		1/8W
J526	ERJ8GCY0R00	M	0 OHM		1/8W	J2054	ERJ8GCY0R00	M	0 OHM		1/8W
J527	ERJ8GCY0R00	M	0 OHM		1/8W	J2055	ERJ8GCY0R00	M	0 OHM		1/8W
J528	ERJ8GCY0R00	M	0 OHM		1/8W	J2056	ERJ8GCY0R00	M	0 OHM		1/8W
J529	ERJ8GCY0R00	M	0 OHM		1/8W	J2058	ERJ8GCY0R00	M	0 OHM		1/8W
J530	ERJ8GCY0R00	M	0 OHM		1/8W	J2059	ERJ8GCY0R00	M	0 OHM		1/8W
J531	ERJ8GCY0R00	M	0 OHM		1/8W	L1001	ERDS2TC0	C	0 OHM		1/4W
J532	ERJ8GCY0R00	M	0 OHM		1/8W	L1003	ERJ8GCY0R00	M	0 OHM		1/8W
J533	ERJ8GCY0R00	M	0 OHM		1/8W	L1103	ERDS2TC0	C	0 OHM		1/4W
J534	ERJ8GCY0R00	M	0 OHM		1/8W	L1109	ERJ8GCY0R00	M	0 OHM		1/8W
J535	ERJ8GCY0R00	M	0 OHM		1/8W	L1201	ERDS2TC0	C	0 OHM		1/4W
J536	ERJ8GCY0R00	M	0 OHM		1/8W	L1209	ERJ8GCY0R00	M	0 OHM		1/8W
J537	ERJ8GCY0R00	M	0 OHM		1/8W	R11	ERJ6ENF1002	M	10K OHM	F	1/10W
J538	ERJ8GCY0R00	M	0 OHM		1/8W	R12	ERJ6ENF4703	M	470K OHM	F	1/10W
J539	ERJ8GCY0R00	M	0 OHM		1/8W	R13	ERJ6ENF1802	M	18K OHM	F	1/10W
J540	ERJ8GCY0R00	M	0 OHM		1/8W	R14	ERJ6ENF3301	M	3.3K OHM	F	1/10W
J541	ERJ8GCY0R00	M	0 OHM		1/8W	R15	TAR1D1D0183-	M	18K OHM	J	1W
J542	ERJ8GCY0R00	M	0 OHM		1/8W	R16	ERJ6ENF6800	M	680 OHM	F	1/10W
J543	ERJ8GCY0R00	M	0 OHM		1/8W	R17	ERJ6ENF5600	M	560 OHM	F	1/10W
J544	ERJ8GCY0R00	M	0 OHM		1/8W	R18	TAR1D1D0273H	M	27K OHM	J	1W
J545	ERJ8GCY0R00	M	0 OHM		1/8W	R19	ERJ6ENF4702	M	47K OHM	F	1/10W
J546	ERJ8GCY0R00	M	0 OHM		1/8W	R20	ERJ6ENF4702	M	47K OHM	F	1/10W
J547	ERJ8GCY0R00	M	0 OHM		1/8W	R22	ERJ6GEY0R00	M	0 OHM		1/10W
J548	ERJ8GCY0R00	M	0 OHM		1/8W	R23	ERJ6GEYJ105	M	1M OHM	J	1/10W
J549	ERJ8GCY0R00	M	0 OHM		1/8W	R24	ERJ6ENF4703	M	470K OHM	F	1/10W
J550	ERJ8GCY0R00	M	0 OHM		1/8W	R25	ERJ6ENF1000	M	100 OHM	F	1/10W
J551	ERJ8GCY0R00	M	0 OHM		1/8W	R101	ERJ6ENF6042	M	60.4K OHM	F	1/10W
J552	ERJ8GCY0R00	M	0 OHM		1/8W	R102	ERJ6ENF6982	M	69.8K OHM	F	1/10W
J553	ERJ8GCY0R00	M	0 OHM		1/8W	R103	ERJ6ENF3742	M	37.4K OHM	F	1/10W
J554	ERJ8GCY0R00	M	0 OHM		1/8W	R105	ERJ6GEYJ102	M	1K OHM	J	1/10W
J555	ERJ8GCY0R00	M	0 OHM		1/8W	R106	ERJ6GEYJ681	M	680 OHM	J	1/10W
J556	ERJ8GCY0R00	M	0 OHM		1/8W	R108	ERJ8ENF1741	M	1.74K OHM	F	1/8W
J557	ERJ8GCY0R00	M	0 OHM		1/8W	R109	ERJ6ENF3321	M	3.32K OHM	F	1/10W
J558	ERJ8GCY0R00	M	0 OHM		1/8W	R111	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
J559	ERJ8GCY0R00	M	0 OHM		1/8W	R113	ERJ8GCYJ272	M	2.7K OHM	J	1/8W
J560	ERJ8GCY0R00	M	0 OHM		1/8W	R114	ERJ8GCYJ2R7	M	2.7 OHM	J	1/8W
J561	ERJ8GCY0R00	M	0 OHM		1/8W	R203	ERJ6GEYJ102	M	1K OHM	J	1/10W
J562	ERJ8GCY0R00	M	0 OHM		1/8W	R204	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
J563	ERJ8GCY0R00	M	0 OHM		1/8W	R205	ERJ6GEYJ106	M	10M OHM	J	1/10W
J565	ERJ8GCY0R00	M	0 OHM		1/8W	R206	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
J567	ERJ8GCY0R00	M	0 OHM		1/8W	R207	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
J568	ERJ8GCY0R00	M	0 OHM		1/8W	R208	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
J569	ERJ8GCY0R00	M	0 OHM		1/8W	R213	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
J572	ERJ8GCY0R00	M	0 OHM		1/8W	R214	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
J573	ERJ8GCY0R00	M	0 OHM		1/8W	R215	ERJ6GEYJ102	M	1K OHM	J	1/10W
J574	ERJ8GCY0R00	M	0 OHM		1/8W	R217	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
J575	ERJ8GCY0R00	M	0 OHM		1/8W	R218	ERJ6GEYJ562	M	5.6K OHM	J	1/10W
J576	ERJ8GCY0R00	M	0 OHM		1/8W	R219	ERDS1FJ391	C	390 OHM	J	1/2W
J577	ERJ8GCY0R00	M	0 OHM		1/8W	R220	ERDS1FJ331	C	330 OHM	J	1/2W
J580	ERJ8GCY0R00	M	0 OHM		1/8W	R221	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
J1301	ERD25TC0	C	0 OHM		1/4W	R223	ERJ6GEYJ102	M	1K OHM	J	1/10W
J2000	ERJ8GCY0R00	M	0 OHM		1/8W	R224	ERJ6ENF2702	M	27K OHM	F	1/10W
J2001	ERJ8GCY0R00	M	0 OHM		1/8W	R225	ERJ6ENF2433	M	243K OHM	F	1/10W
J2002	ERJ8GCY0R00	M	0 OHM		1/8W	R247	ERJ6GEYJ101	M	100 OHM	J	1/10W
J2003	ERJ8GCY0R00	M	0 OHM		1/8W	R248	ERJ6GEYJ101	M	100 OHM	J	1/10W
J2004	ERJ8GCY0R00	M	0 OHM		1/8W	R249	ERJ6GEYJ101	M	100 OHM	J	1/10W
J2005	ERJ8GCY0R00	M	0 OHM		1/8W	R250	ERJ6GEYJ392	M	3.9K OHM	J	1/10W
J2006	ERJ8GCY0R00	M	0 OHM		1/8W	R251	ERJ6GEYJ562	M	5.6K OHM	J	1/10W
J2007	ERJ8GCY0R00	M	0 OHM		1/8W	R252	ERJ6GEYJ102	M	1K OHM	J	1/10W
J2008	ERJ8GCY0R00	M	0 OHM		1/8W	R281	ERJ8ENF3010	M	301 OHM	F	1/8W
J2009	ERJ8GCY0R00	M	0 OHM		1/8W	R282	ERJ8ENF3010	M	301 OHM	F	1/8W

Ref.No.	Part No.		Description			Ref.No.	Part No.		Description		
R293	ERJ6GEYJ473	M	47K OHM	J	1/10W	R419	ERJ8GCYJ272	M	2.7K OHM	J	1/8W
R295	ERJ6ENF3010	M	301 OHM	F	1/8W	R422	ERG1SJ331	M	330 OHM	J	1W
R297	ERJ8GCYJ122	M	1.2K OHM	J	1/8W	R423	ERX2SJR82	M	0.82 OHM	J	2W
R298	ERJ8GCYJ122	M	1.2K OHM	J	1/8W	R424	ERDS1FJ392	C	3.9K OHM	J	1/2W
R299	ERDS1FJ103	C	10K OHM	J	1/2W	R425	ERJ8GCY0R00	M	0 OHM		1/8W
R301	ERJ6GEYJ472	M	4.7K OHM	J	1/10W	R426	ERDS2CKF4421	M	4.42K OHM	F	1/4W
R302	ERJ6GEYJ152	M	1.5K OHM	J	1/10W	R427	ERDS2TJ1R5	C	1.5 OHM	J	1/4W
R303	ERJ6GEYJ223	M	22K OHM	J	1/10W	R428	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R304	ERJ6GEYJ102	M	1K OHM	J	1/10W	R429	ERG1SJP4R7S	F	4.7 OHM	J	1W
R305	ERJ6ENF3402	M	34K OHM	F	1/10W	R431	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R306	ERJ6ENF2003	M	200K OHM	F	1/10W	R432	ERG2SJ680	M	68 OHM	J	2W
R307	ERDS1FJ681	C	680 OHM	J	1/2W	R434	ERG25FJ3R3K	C	3.3 OHM	J	1/4W
R308	ERJ6GEYJ153	M	15K OHM	J	1/10W	R435	ERD25FJ3R3K	C	3.3 OHM	J	1/4W
R309	ERJ6GEYJ472	M	4.7K OHM	J	1/10W	R436	ERG3FJ680	M	68 OHM	J	3W
R310	ERJ8GCYJ102	M	1K OHM	J	1/8W	R437	ERDS2TJ332	C	3.3K OHM	J	1/4W
R311	ERJ6GEYJ153	M	15K OHM	J	1/10W	R438	ERG3FJ470	M	47 OHM	J	3W
R313	ERJ6GEYJ472	M	4.7K OHM	J	1/10W	R500	ERJ6ENF4221	M	4.22K OHM	F	1/10W
R316	ERDS1FJ274	C	270K OHM	J	1/2W	R502	ERJ6ENF5111	M	5.11K OHM	F	1/10W
R317	ERDS1FJ274	C	270K OHM	J	1/2W	R503	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R318	ERDS2TJ224	C	220K OHM	J	1/4W	R504	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R319	ERJ6GEYJ821	M	820 OHM	J	1/10W	R505	ERJ6GEYJ103	M	10K OHM	J	1/10W
R320	ERJ8GCYJ822	M	8.2K OHM	J	1/8W	R507	ERJ6GEY0R00	M	0 OHM		1/10W
R321	ERDS1FJ153	C	15K OHM	J	1/2W	R508	ERD25FJ392K	C	3.9K OHM	J	1/4W
R322	ERDS2TJ102	C	1K OHM	J	1/4W	R510	ERJ6GEY0R00	M	0 OHM		1/10W
R334	ERDS1FJ274	C	270K OHM	J	1/2W	R516	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R336	ERDS1FJ125	C	1.2M OHM	J	1/2W	R526	ERJ6ENF2211	M	2.21K OHM	F	1/10W
R337	ERJ6GEYJ103	M	10K OHM	J	1/10W	R527	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R346	ERJ6ENF3832	M	38.3K OHM	F	1/10W	R528	ERJ6ENF8200	M	820 OHM	F	1/10W
R347	ERJ6ENF3922	M	39.2K OHM	F	1/10W	R534	ERD25FJ103K	C	10K OHM	J	1/4W
R348	ERJ6ENF1213	M	121K OHM	F	1/10W	R535	ERX1SJR22	M	0.22 OHM	J	1W
R363	ERDS1FJ151	C	150 OHM	J	1/2W	R536	ERD25FJ103K	C	10K OHM	J	1/4W
R371	ERJ6ENF1622	M	16.2K OHM	F	1/10W	R537	ERJ6ENF5600	M	560 OHM	F	1/10W
R372	ERJ6ENF1002	M	10K OHM	F	1/10W	R538	ERJ6ENF1433	M	143K OHM	F	1/10W
R373	ERJ6ENF7681	M	7.68K OHM	F	1/10W	R540	ERJ12YJ101	M	100 OHM	J	1/2W
R374	ERJ6GEYJ103	M	10K OHM	J	1/10W	R541	ERJ6GEYJ683	M	68K OHM	J	1/10W
R375	ERJ6GEYJ472	M	4.7K OHM	J	1/10W	R542	ERJ6ENF3241	M	3.24K OHM	F	1/10W
R376	ERJ6ENF5622	M	56.2K OHM	F	1/10W	R543	ERJ6GEYJ563	M	56K OHM	J	1/10W
R377	ERJ6ENF1102	M	11K OHM	F	1/10W	R544	ERJ8ENF1332	M	13.3K OHM	F	1/8W
R378	ERJ6ENF1213	M	121K OHM	F	1/10W	R545	TARRS5B820J2	M	82 OHM	J	5W
R379	ERJ6ENF1782	M	17.8K OHM	F	1/10W	R546	TARRS5B561J2	M	560 OHM	J	5W
R380	ERDS2TJ121	C	120 OHM	J	1/4W	R547	ERJ6GEYJ470	M	47 OHM	J	1/10W
R381	ERJ6GEYJ102	M	1K OHM	J	1/10W	R548	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R390	ERJ8GCY0R00	M	0 OHM		1/8W	R549	ERG1SJ561	M	560 OHM	J	1W
R391	ERJ8GCY0R00	M	0 OHM		1/8W	R550	ERG12AJR12HK	F	0.12 OHM	J	1/2W
R392	ERJ8GCY0R00	M	0 OHM		1/8W	R551	ERX2SJ1R5	M	1.5 OHM	J	2W
R393	ERJ8GCY0R00	M	0 OHM		1/8W	R552	ERX2SJ1R8	M	1.8 OHM	J	2W
R400	ERD25FJ472K	C	4.7K OHM	J	1/4W	R553	ERJ6GEYJ103	M	10K OHM	J	1/10W
R401	ERJ6GEYJ470	M	47 OHM	J	1/10W	R554	ERX3FJX6R8D	M	6.8 OHM	J	3W
R403	ERJ6ENF8252	M	82.5K OHM	F	1/10W	R555	ERD25FJ103K	C	10K OHM	J	1/4W
R405	ERQ14AJ220	F	22 OHM	J	1/4W	R556	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R407	ERJ6GEYJ103	M	10K OHM	J	1/10W	R557	ERJ6GEYJ103	M	10K OHM	J	1/10W
R408	ERJ6ENF5621	M	5.62K OHM	F	1/10W	R558	ERJ6GEYJ103	M	10K OHM	J	1/10W
R409	ERJ8ENF1822	M	18.2K OHM	F	1/8W	R559	ERJ6GEYJ102	M	1K OHM	J	1/10W
R410	ERJ6ENF3651	M	3.65K OHM	F	1/10W	R560	ERDS1FJ472	C	4.7K OHM	J	1/2W
R411	ERJ6ENF2741	M	2.74K OHM	F	1/10W	R561	ERJ6GEYJ100	M	10 OHM	J	1/10W
R412	ERJ6ENF8251	M	8.25K OHM	F	1/10W	R562	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R413	ERJ6ENF2211	M	2.21K OHM	F	1/10W	R564	ERJ6GEYJ100	M	10 OHM	J	1/10W
R414	ERJ6ENF1961	M	1.96K OHM	F	1/10W	R565	ERDS1FJ472	C	4.7K OHM	J	1/2W
R415	ERDS2TJ472	C	4.7K OHM	J	1/4W	R566	ERJ8GCYJ472	M	4.7K OHM	J	1/8W
R416	ERJ6GEYJ122	M	1.2K OHM	J	1/10W	R575	ERDS1FJ151	C	150 OHM	J	1/2W
R417	ERDS2TJ472	C	4.7K OHM	J	1/4W	R576	ERJ6ENF1622	M	16.2K OHM	F	1/10W
R418	ERDS2CKF2151	M	2.15K OHM	F	1/4W	R577	ERJ6ENF4121	M	4.12K OHM	F	1/10W

Ref.No.	Part No.		Description		
R573	ERJ6GEYJ102	M	1K OHM	J	1/10W
R574	ERD25FJ470K	C	47 OHM	J	1/4W
R575	ERD52TJ101	C	100 OHM	J	1/4W
R576	ERD52TJ101	C	100 OHM	J	1/4W
R577	ERD52TJ332	C	3.3K OHM	J	1/4W
R578	TARR55B150J2	M	15 OHM	J	5W
R579	TARR55B150J2	M	15 OHM	J	5W
R580	ERJ6ENF249*	■	2.49K OHM	F	1/10W
R581	ERJ6GEYJ272	■	2.7K OHM	J	1/10W
R582	ERJ6GEYJ103	M	10K OHM	J	1/10W
R583	ERG3FG393	M	39K OHM	G	3W
R584	ERD52TJ121	C	120 OHM	J	1/4W
R585	ERD51FJ1R8	C	1.8 OHM	J	1/2W
R586	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
R588	ERJ6GEY0R00	M	0 OHM		1/10W
R601	ERQ12AJ101	F	100 OHM	J	1/2W
R602	ERQ14AJ100	F	10 OHM	J	1/4W
R603	ERJ8GCY0R00	■	0 OHM		1/8W
R605	ERD25FJ100K	C	10 OHM	J	1/4W
R606	ERD51FJ184	C	180K OHM	J	1/2W
R607	ERD51FJ184	C	180K OHM	J	1/2W
R608	ERD51FJ184	C	180K OHM	J	1/2W
R609	ERD51FJ184	C	180K OHM	J	1/2W
R610	ERD51FJ184	C	180K OHM	J	1/2W
R611	ERG1SJ683	M	68K OHM	J	1W
R612	ERJ12YJ274	M	270K OHM	J	1/2W
R613	ERJ12YJ564	■	560K OHM	J	1/2W
R614	ERJ12YJ184	■	180K OHM	J	1/2W
R615	ERJ6GEYJ392	■	3.9K OHM	J	1/10W
R616	ERJ6GEYJ123	■	12K OHM	J	1/10W
R617	ERJ6ENF3091	M	3.09K OHM	F	1/10W
R618	ERJ12YJ105	M	1M OHM	J	1/2W
R620	ERJ8GCYJ474	■	470K OHM	J	1/8W
R621	ERD52TJ125	C	1.2M OHM	J	1/4W
R622	ERJ6GEYJ223	M	22K OHM	J	1/10W
R623	ERJ8ENF1102	M	11K OHM	F	1/8W
R624	ERD52CKF1211	M	1.21K OHM	F	1/4W
R625	ERJ6ENF2211	M	2.21K OHM	F	1/10W
R627	ERJ6GEYJ102	M	1K OHM	J	1/10W
R628	ERJ6GEYJ105	M	1M OHM	J	1/10W
R629	ERJ6GEYJ101	M	100 OHM	J	1/10W
R630	ERJ6GEYJ102	M	1K OHM	J	1/10W
R631	ERJ6GEYJ123	M	12K OHM	J	1/10W
R632	ERJ6GEYJ103	M	10K OHM	J	1/10W
R643	ERJ6GEY0R00	M	0 OHM		1/10W
R644	ERJ6GEYJ102	M	1K OHM	J	1/10W
R645	ERJ8GCYJ222	M	2.2K OHM	J	1/8W
R648	ERJ6GEYJ102	M	1K OHM	J	1/10W
R650	ERJ6GEYJ471	M	470 OHM	J	1/10W
R660	ERJ8ENF5110	M	511 OHM	F	1/8W
R661	ERJ6GEYJ823	M	82K OHM	J	1/10W
R662	ERJ6GEYJ102	M	1K OHM	J	1/10W
R663	ERJ6GEYJ103	M	10K OHM	J	1/10W
R664	ERJ8GCYJ103	M	10K OHM	J	1/8W
R665	ERJ6GEYJ103	M	10K OHM	J	1/10W
R666	ERJ6GEYJ122	M	1.2K OHM	J	1/10W
R667	ERJ6GEYJ222	■	2.2K OHM	J	1/10W
R668	ERJ8GCYJ104	M	100K OHM	J	1/8W
R669	ERJ6GEYJ392	M	3.9K OHM	J	1/10W
R670	ERD51FJ104	C	100K OHM	J	1/2W
R671	ERJ6GEYJ562	■	5.6K OHM	J	1/10W
R672	ERJ6GEYJ102	■	1K OHM	J	1/10W
R673	ERD51FJ331	C	330 OHM	J	1/2W
R675	ERQ14AJ101	F	100 OHM	J	1/4W
R676	ERQ14AJ101	F	100 OHM	J	1/4W
R678	ERD51FJ220	C	22 OHM	J	1/2W
R679	ERJ6GEYJ104	M	100K OHM	J	1/10W
R680	ERJ6GEYJ104	M	100K OHM	J	1/10W
R682	ERJ6GEYJ101	■	100 OHM	J	1/10W
R683	ERJ6GEYJ822	M	8.2K OHM	J	1/10W
R701	ERJ6GEYJ392	■	3.9K OHM	J	1/10W
R702	ERJ6GEYJ392	M	3.9K OHM	J	1/10W
R703	ERJ6GEYJ103	M	10K OHM	J	1/10W
R715	ERJ6GEYJ392	M	3.9K OHM	J	1/10W
R719	ERJ6GEYJ392	■	3.9K OHM	J	1/10W
R721	ERJ6GEYJ102	M	1K OHM	J	1/10W
R724	ERJ6GEYJ102	■	1K OHM	J	1/10W
R801	ERC12AGK394	S	390K OHM	K	1/2W
R802	ERJ6GEYJ273	M	27K OHM	J	1/10W
R804	ERJ8GCYJ471	■	470 OHM	J	1/8W
R805	ERJ6GEYJ102	M	1K OHM	J	1/10W
R807	ERJ8GCYJ562	M	5.6K OHM	J	1/8W
R808	ERJ6GEYJ471	M	470 OHM	J	1/10W
R809	ERD51FJ223	C	22K OHM	J	1/2W
R810	ERJ6GEYJ391	M	390 OHM	J	1/10W
R811	ERD51FJ224	C	220K OHM	J	1/2W
R812	ERD51FJ274	C	270K OHM	J	1/2W
R813	ERJ6GEYJ152	M	1.5K OHM	J	1/10W
R814	ERJ6GEYJ151	M	150 OHM	J	1/10W
R815	ERJ6GEYJ681	M	680 OHM	J	1/10W
R816	ERJ6ENF2551	■	2.55K OHM	F	1/10W
R817	ERQ12AJ6R8	F	6.8 OHM	J	1/2W
R818	ERJ6GEY0R00	■	0 OHM		1/10W
R819	ERD52TJ224	C	220K OHM	J	1/4W
R820	ERD52TJ224	C	220K OHM	J	1/4W
R821	TARR53833J2	M	33K OHM	J	3W
R822	ERJ6GEYJ182	■	1.8K OHM	J	1/10W
R823	ERJ6GEYJ102	M	1K OHM	J	1/10W
R824	ERJ8GCYJ681	■	680 OHM	J	1/8W
R825	ERJ6GEYJ821	■	820 OHM	J	1/10W
R826	ERJ6ENF1431	■	1.43K OHM	F	1/10W
R827	ERJ6ENF4871	M	4.87K OHM	F	1/10W
R829	ERJ6GEYJ102	M	1K OHM	J	1/10W
R831	ERJ6GEYJ103	M	10K OHM	J	1/10W
R833	ERJ6GEYJ102	M	1K OHM	J	1/10W
R834	ERW2PKR12	W	0.12 OHM	K	2W
R836	ERG2SJ223	M	22K OHM	J	2W
R837	ERG2SJ223	M	22K OHM	J	2W
R838	ERJ6GEYJ102	M	1K OHM	J	1/10W
R839	ERD51FJ223	C	22K OHM	J	1/2W
R840	ERQ1CKPR39S	F	0.39 OHM	K	1W
R841	ERQ12AJR33HK	F	0.33 OHM	J	1/2W
R842	ERQ12HJ1R2	F	1.2 OHM	J	1/2W
R843	ERQ12AJR12HK	F	0.12 OHM	J	1/2W
R844	ERQ12AJR12HK	F	0.12 OHM	J	1/2W
R845	TAR16BKQR11Z	F	0.11 OHM	K	1/4W
R846	ERD51FJ221	C	220 OHM	J	1/2W
R847	ERJ12YJ122	■	1.2K OHM	J	1/2W
R849	ERJ6GEYJ473	M	47K OHM	J	1/10W
R850	ERD25CKF2201	M	2.2K OHM	F	1/4W
R851	ERQ14AJ010HK	F	1 OHM	J	1/4W
R852	ERJ6GEYJ103	M	10K OHM	J	1/10W
R854	ERG3FJ330	M	33 OHM	J	3W
R855	ERJ6ENF2101	M	2.1K OHM	F	1/10W

Ref.No.	Part No.		Description		
R857	ERJ6GEYJ683	M	68K OHM	J	1/10W
R858	ERDS1FJ222	C	2.2K OHM	J	1/2W
R859	ERDS1FJ222	C	2.2K OHM	J	1/2W
R860	ERJ6GEYJ103	M	10K OHM	J	1/10W
R861	PAR18BKOR11Z	■	0.11 OHM	K	1/4W
R862	ERJ6ENF1302	M	13K OHM	F	1/10W
R863	ERDS1FJ332	C	3.3K OHM	J	1/2W
R864	ERG2SJ223	M	22K OHM	J	2W
R865	ERJ6GEY0R00	M	0 OHM		1/10W
R867	ERJ6ENF3741	■	3.74K OHM	F	1/10W
R868	ERJ6ENF6851	■	6.65K OHM	F	1/10W
R869	ERJ6ENF4221	M	4.22K OHM	F	1/10W
R871	ERJ12YJ104	M	100K OHM	J	1/2W
R872	ERJ12YJ104	M	100K OHM	J	1/2W
R875	ERDS1FJ224	C	220K OHM	J	1/2W
R887	ERDS2CKF6801	M	6.8K OHM	F	1/4W
R888	ERJ8GCYJ472	M	4.7K OHM	J	1/8W
R889	ERDS1FJ683	C	68K OHM	J	1/2W
R890	ERX3FJX1R60	■	1.6 OHM	J	3W
R891	ERDS1FJ224	C	220K OHM	J	1/2W
R892	ERDS1FJ334	C	330K OHM	J	1/2W
R893	ERDS1FJ334	C	330K OHM	J	1/2W
R895	ERJ6GEYJ102	M	1K OHM	J	1/10W
R896	ERJ6GEYJ332	■	3.3K OHM	J	1/10W
R897	ERDS1FJ334	C	330K OHM	J	1/2W
R898	ERDS1FJ470	C	47 OHM	J	1/2W
R899	ERDS1FJ224	C	220K OHM	J	1/2W
R900	ERDS1FJ334	C	330K OHM	J	1/2W
R901	ERJ6GEYJ103	■	10K OHM	J	1/10W
R902	ERJ6GEYJ682	■	6.8K OHM	J	1/10W
R903	ERJ6GEYJ102	M	1K OHM	J	1/10W
R904	ERJ8GCYJ223	M	22K OHM	J	1/8W
R905	ERJ8GCYJ223	M	22K OHM	J	1/8W
R906	ERJ8GCYJ103	M	10K OHM	J	1/8W
R907	ERJ6GEYJ104	M	100K OHM	J	1/10W
R908	ERJ8GCYJ102	■	1K OHM	J	1/8W
R909	ERJ8GCYJ103	M	10K OHM	J	1/8W
R910	ERJ8GCYJ563	M	56K OHM	J	1/8W
R911	ERJ8GCYJ563	M	56K OHM	J	1/8W
R912	ERJ8GCYJ563	■	56K OHM	J	1/8W
R913	ERJ8GCYJ563	M	56K OHM	J	1/8W
R914	ERJ6GEYJ563	M	56K OHM	J	1/10W
R915	ERJ6GEYJ563	M	56K OHM	J	1/10W
R916	ERJ6GEYJ563	M	56K OHM	J	1/10W
R917	ERJ8GEYJ331	M	330 OHM	J	1/10W
R918	ERJ6GEYJ101	M	100 OHM	J	1/10W
R939	ERJ6GEYJ471	M	470 OHM	J	1/10W
R940	ERJ6GEYJ223	M	22K OHM	J	1/10W
R941	ERJ6GEYJ223	M	22K OHM	J	1/10W
R943	ERJ6GEYJ103	M	10K OHM	J	1/10W
R944	ERJ6GEYJ103	M	10K OHM	J	1/10W
R945	ERJ6GEYJ101	M	100 OHM	J	1/10W
R947	ERJ6GEYJ331	M	330 OHM	J	1/10W
R949	ERJ8GCYJ223	M	22K OHM	J	1/8W
R950	ERJ8GCYJ223	M	22K OHM	J	1/8W
R951	ERJ6GEYJ223	M	22K OHM	J	1/10W
R952	ERJ6GEYJ223	M	22K OHM	J	1/10W
R962	ERJ6GEYJ103	M	10K OHM	J	1/10W
R963	ERJ6GEYJ103	■	10K OHM	J	1/10W
R969	ERJ6GEYJ334	M	330K OHM	J	1/10W
R970	ERJ6GEYJ334	■	330K OHM	J	1/10W
R971	ERJ8GEYJ334	■	330K OHM	J	1/10W
R973	ERJ8GCYJ103	M	10K OHM	J	1/8W
R974	ERJ8GCYJ103	■	10K OHM	J	1/8W
R975	ERJ8GCYJ103	■	10K OHM	J	1/8W
R977	ERJ6GEYJ223	M	22K OHM	J	1/10W
R978	ERJ6GEYJ392	M	3.9K OHM	J	1/10W
R979	ERJ6GEYJ392	■	3.9K OHM	J	1/10W
R980	ERJ6GEYJ822	M	8.2K OHM	J	1/10W
R981	ERJ6GEYJ333	M	33K OHM	J	1/10W
R982	ERJ6GEYJ101	M	100 OHM	J	1/10W
R983	ERJ6GEYJ101	M	100 OHM	J	1/10W
R984	ERJ6GEYJ101	M	100 OHM	J	1/10W
R985	ERJ6GEYJ101	M	100 OHM	J	1/10W
R986	ERDS2TJ221	C	220 OHM	J	1/4W
R993	ERJ6GEY0R00	M	0 OHM		1/10W
R1002	ERJ8ENF75R0	M	75 OHM	F	1/8W
R1004	ERJ6GEYJ330	M	33 OHM	J	1/10W
R1005	ERJ6GEY0R00	M	0 OHM		1/10W
R1007	ERJ6ENF29R4	■	29.4 OHM	F	1/10W
R1008	ERJ6ENF7320	M	732 OHM	F	1/10W
R1009	ERJ6ENF3900	M	390 OHM	F	1/10W
R1010	ERJ6ENF5600	M	560 OHM	F	1/10W
R1011	ERJ6GEYJ300	M	30 OHM	J	1/10W
R1012	ERDS2TJ101	C	100 OHM	J	1/4W
R1013	ERD25CKF4702	M	47K OHM	F	1/4W
R1014	ERDS2CKF3091	M	3.09K OHM	■	1/4W
R1015	ERJ6ENF6811	■	6.81K OHM	■	1/10W
R1018	ERDS1FJ101	C	100 OHM	J	1/2W
R1019	ERG2SJ123	M	12K OHM	J	2W
R1020	ERJ6ENF1002	■	10K OHM	F	1/10W
R1021	ERJ6ENF1002	■	10K OHM	F	1/10W
R1022	ERDS1FJ220	C	22 OHM	J	1/2W
R1023	ERDS2TJ102	C	1K OHM	J	1/4W
R1024	ERJ6GEYJ822	M	8.2K OHM	J	1/10W
R1025	ERJ6ENF1202	M	12K OHM	F	1/10W
R1026	ERDS2CKF2262	M	22.6K OHM	■	1/4W
R1027	ERJ6ENF1002	■	10K OHM	■	1/10W
R1028	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R1030	ERJ6GEY0R00	M	0 OHM		1/10W
R1112	ERDS2TJ470	C	47 OHM		
R1113	ERD25CKF4702	M	47K OHM		
R1114	ERDS2CKF3091	M	3.09K OHM		
R1115	ERJ6ENF6811	M	6.81K OHM		
R1118	ERDS1FJ101	C	100 OHM		
R1119	ERG2SJ123	M	12K OHM		
R1120	ERJ6ENF1002	M	10K OHM		
R1121	ERJ6ENF1002	M	10K OHM		
R1122	ERDS1FJ220	C	22 OHM		
R1123	ERDS2TJ102	C	1K OHM		

Ref.No.	Part No.		Description		
R1124	ERJ6GEYJ822	M	8.2K OHM	J	1/10W
R1125	ERJ6ENF1202	M	12K OHM	F	1/10W
R1126	ERDS2CKF2262	M	22.6K OHM	F	1/4W
R1127	ERJ6ENF1002	M	10K OHM	F	1/10W
R1128	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R1130	ERJ6GEY0R00	M	0 OHM		1/10W
R1131	ERJ6GEYJ330	M	33 OHM	J	1/8W
R1202	ERJ8ENF75R0	M	75 OHM	F	1/8W
R1204	ERJ6GEYJ330	M	33 OHM	J	1/10W
R1205	ERJ6GEYJ682	M	6.8K OHM	J	1/10W
R1207	ERJ6ENF66R5	M	66.5 OHM	F	1/10W
R1208	ERJ6ENF7320	M	732 OHM	F	1/10W
R1209	ERJ6ENF3900	M	390 OHM	F	1/10W
R1210	ERJ6ENF5600	M	560 OHM	F	1/10W
R1211	ERJ6GEYJ220	M	22 OHM	J	1/10W
R1212	ERDS2TJ331	C	330 OHM	J	1/4W
R1213	ERD2SCKF4702	M	47K OHM	F	1/4W
R1214	ERDS2CKF3091	M	3.09K OHM	F	1/4W
R1215	ERJ6ENF6811	M	6.81K OHM	F	1/10W
R1218	ERDS1FJ101	C	100 OHM	J	1/2W
R1219	ERG3SJ123	M	12K OHM	J	3W
R1220	ERJ6ENF1002	M	10K OHM	F	1/10W
R1221	ERJ6ENF1002	M	10K OHM	F	1/10W
R1222	ERDS1FJ220	C	22 OHM	J	1/2W
R1223	ERDS2TJ102	C	1K OHM	J	1/4W
R1224	ERJ6GEYJ822	M	8.2K OHM	J	1/10W
R1225	ERJ6ENF1202	M	12K OHM	F	1/10W
R1226	ERDS2CKF2262	M	22.6K OHM	F	1/4W
R1227	ERJ6ENF1002	M	10K OHM	F	1/10W
R1228	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R1230	ERJ6GEY0R00	M	0 OHM		1/10W
R1301	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R1302	ERJ6GEYJ102	M	1K OHM	J	1/10W
R1303	ERJ6GEYJ753	M	75K OHM	J	1/10W
R1305	ERJ6ENF1002	M	10K OHM	F	1/10W
R1306	ERJ6ENF1002	M	10K OHM	F	1/10W
R1307	ERJ6GEYJ271	M	270 OHM	J	1/10W
R1308	ERJ6GEYJ102	M	1K OHM	J	1/10W
R1312	ERJ6GEYJ102	M	1K OHM	J	1/10W
R1313	ERJ6GEYJ102	M	1K OHM	J	1/10W
R1314	ERJ6GEYJ331	M	330 OHM	J	1/10W
R1315	ERJ6GEYJ474	M	470K OHM	J	1/10W
R1316	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R1317	ERJ6ENF9101	M	9.1K OHM	F	1/10W
R1318	ERJ6GEYJ682	M	6.8K OHM	J	1/10W
R1320	ERJ6ENF2701	M	2.7K OHM	F	1/10W
R1322	ERJ6GEYJ100	M	10 OHM	J	1/10W
R1324	ERJ6GEYJ103	M	10K OHM	J	1/10W
R1325	ERJ6GEYJ223	M	22K OHM	J	1/10W
R1326	ERJ6GEYJ223	M	22K OHM	J	1/10W
R1327	ERJ6GEYJ103	M	10K OHM	J	1/10W
R1328	ERJ6GEYJ102	M	1K OHM	J	1/10W
R1329	ERJ6GEYJ102	M	1K OHM	J	1/10W
R1330	ERJ6ENF8251	M	8.25K OHM	F	1/10W
R1331	ERJ6ENF1502	M	15K OHM	F	1/10W
R1332	ERJ6ENF1002	M	10K OHM	F	1/10W
R1333	ERJ8GEYJ681	M	680 OHM	J	1/8W
R1334	ERJ6GEYJ101	M	100 OHM	J	1/10W
R1335	ERJ12YJ102	M	1K OHM	J	1/2W
R1336	ERJ6GEYJ102	M	1K OHM	J	1/10W
R1337	ERJ6GEYJ101	M	100 OHM	J	1/10W
R1338	ERJ6GEYJ101	M	100 OHM	J	1/10W
R1339	ERJ6GEYJ101	M	100 OHM	J	1/10W
R1401	ERJ6GEYJ331	M	330 OHM	J	1/10W
R1402	ERJ6ENF2702	M	27K OHM	F	1/10W
R1403	ERJ6ENF3301	M	3.3K OHM	F	1/10W
R1404	ERJ6ENF2212	M	22.1K OHM	F	1/10W
R1405	ERJ6ENF5621	M	5.62K OHM	F	1/10W
R1408	ERJ6ENF1002	M	10K OHM	F	1/10W
R1409	ERJ6ENF1002	M	10K OHM	F	1/10W
R1410	ERJ6GEYJ124	M	120K OHM	J	1/10W
R1411	ERJ6GEYJ101	M	100 OHM	J	1/10W
R2301	ERJ6GEYJ102	M	1K OHM	J	1/10W
R2302	ERJ6GEYJ102	M	1K OHM	J	1/10W
R2303	ERDS1FJ2R2	C	2.2 OHM	J	1/2W
R2304	ERDS1FJ2R2	C	2.2 OHM	J	1/2W
R2305	ERJ6GEYJ331	M	330 OHM	J	1/10W
R2306	ERJ6GEYJ331	M	330 OHM	J	1/10W
R2307	ERJ6GEY0R00	M	0 OHM		1/10W
R2308	ERJ6GEY0R00	M	0 OHM		1/10W
R2401	ERJ6GEYJ103	M	10K OHM	J	1/10W
R2402	ERJ6GEYJ683	M	68K OHM	J	1/10W
R2403	ERJ6GEYJ103	M	10K OHM	J	1/10W
R2404	ERJ6GEYJ683	M	68K OHM	J	1/10W
R2405	ERJ6ENF4021	M	4.02K OHM	F	1/10W
R2406	ERJ6ENF3571	M	3.57K OHM	F	1/10W
R2407	ERJ6ENF4021	M	4.02K OHM	F	1/10W
R2408	ERJ6ENF1002	M	10K OHM	F	1/10W
R2409	ERJ6GEYJ102	M	1K OHM	J	1/10W
R2410	ERJ6GEYJ102	M	1K OHM	J	1/10W
R2411	ERJ6ENF6651	M	6.65K OHM	F	1/10W
R2412	ERJ6ENF2491	M	2.49K OHM	F	1/10W
R2413	ERJ6GEYJ102	M	1K OHM	J	1/10W
R2414	ERG2SJ181	M	180 OHM	J	2W
R2415	ERJ6GEYJ822	M	8.2K OHM	J	1/10W
R2416	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R2417	ERJ6GEYJ562	M	5.6K OHM	J	1/10W
R2418	ERJ6GEYJ682	M	6.8K OHM	J	1/10W

	OTHERS	
	TES4003	SPRING(PCB EARTH)
	TES9541-1	SPRING(LED)
	TMKE008	SILICONE SHEET
	TMKK001	TAPE
	TMKS7907	MICA SHEET
	TUC87574	AC INLET BRACKET
	TUW85515	JACK BRACKET
	XTB3+6C	SCREW
	XTV3+12J	SCREW
	XTV3+16J	SCREW
	XWGT40660	WASHER
	XWG3F10	WASHER
⚠ FB01	XBA2C31TB15L	FUSE(3.15A)
FG1	TJE85318	LUG TERMINAL
FG2	TJC85341	EARTH LUG
FG3	TJC85341	EARTH LUG
FG4	TJC85341	EARTH LUG
FG8	TJC85341	EARTH LUG
FS801	TJC85502T	FUSE HOLDER
FS803	TJC85502T	FUSE HOLDER
JC101	TJC85341	EARTH LUG
JC102	TJC85341	EARTH LUG
JK2001	TJS9A8440	HEADPHONE JACK
JK2002	TJS9A8440	HEADPHONE JACK

Ref.No.	Part No.	Description
JK2003	TJS9A9820	MINI JACK
JK2004	TJS9A8810	PHONE PIN SOCKET(2P)
N10	TJS9A9730	10P CONNECTOR
N18	TJS9A9730	10P CONNECTOR
N11	TJSF00602	2P CONNECTOR
N12	TJSF00603	3P CONNECTOR
N12A	TJS9A9740	22P CONNECTOR
N12B	TJS9A9740	22P CONNECTOR
N13	TJSF00604	4P CONNECTOR
N21A	EMCS0264MB	2P CONNECTOR(BLUE)
N22A	EMCS0564M	5P CONNECTOR
N101	TJS118590	2P CONNECTOR
N103	TJS8A9880	15P CONNECTOR
N104A	EMCS0364M	3P CONNECTOR
N104B	-TAA△TV3P1663	3P CONNECTOR ASSY
N105	TJC65342T	LUG TERMINAL
N107A	EMCS0264M	2P CONNECTOR
N331	TJS1A5290	CRT SOCKET
⚠ N801	TJS8A9361	AC SOCKET
N803A	EMCS0264M	2P CONNECTOR
N901	EMCS0451ML	4P CONNECTOR(L-TYPE)
N2001A	EMCS0664M	6P CONNECTOR
N2001B	EMCS0651ML	6P CONNECTOR(L-TYPE)
N2002	EMCS0264M	2P CONNECTOR
N2003	EMCS0464M	4P CONNECTOR
N2005	EMCS0564M	5P CONNECTOR
N2007A	EMCS0551ML	5P CONNECTOR
N510-1	TEL302-9	TERMINAL
N510-2	TEL302-9	TERMINAL
N510-3	TEL302-9	TERMINAL
N510-4	TEL302-9	TERMINAL
N802-1	TEL302-9	TERMINAL
N802-2	TEL302-9	TERMINAL
⚠ PC830	PC123FY8	PHOTO COUPLER
⚠ PC831	PC123FY8	PHOTO COUPLER
⚠ PC832	TLP750D4	PHOTO COUPLER
S290	TAG10003	SPARK GAP
S301	TGPS1S2GL	SPARK GAP
S501	TAGDSP201M8	SPARK GAP
S1001	TAGDSP141TTA	SPARK GAP
S1101	TAGDSP141TTA	SPARK GAP
S1201	TAGDSP141TTA	SPARK GAP
⚠ SW801	ESB91231A	SWITCH(POWER)
SW901	EVQP8005K	SWITCH
SW902	EVQP8005K	SWITCH
SW903	EVQP8005K	SWITCH
SW904	EVQP8005K	SWITCH
SW905	EVQ33405R	SWITCH
SW906	EVQ33405R	SWITCH
SW907	EVQ33405R	SWITCH
TP1	TEL302-9	TERMINAL
TP2	TEL302-9	TERMINAL
TP3	TEL302-9	TERMINAL
TP4	TEL302-9	TERMINAL
TP5	TEL302-9	TERMINAL
X901	TSS2165TM	CRYSTAL OSCILLATOR

⚠ WARNING

This service information is designed for experienced repair technicians only and not for general public use.

It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.

Products powered by electricity should be serviced or repaired only by experienced professional technicians.

Any attempt to service or repair the product or products dealt within this service information by anyone else could result in serious injury or death.

SAFETY PRECAUTIONS

1 CAUTION:
No modification of any circuit should be attempted. Service work should only be performed after you are thoroughly familiar with all of the following safety checks and servicing guidelines.

2 SAFETY CHECK
Care should be taken while servicing this CRT display because of the high voltage used in the deflection circuits. These voltages are found in areas such as the associated flyback and yoke circuits.

3 FIRE & SHOCK HAZARD

3-1 Insert an isolation transformer between the CRT display and the AC power line before servicing the chassis.

3-2 In servicing, pay attention to original lead dress especially in the high voltage circuit. If a short circuit is found, replace all parts which have been overheated as a result of the short circuit.

3-3 All the protective devices must be reinstalled per original design.

3-4 Soldering must be inspected for possible cold solder joints, frayed leads, damaged insulation, solder splashes or sharp solder points. Be certain to remove any foreign material.

4 LEAKAGE CURRENT COLD CHECK

4-1 Unplug the AC cord and connect a jumper between the two prongs on the plug.

4-2 Turn the CRT display power switch "on".

4-3 Measure the resistance value with an ohmmeter between the jumper AC plug and each exposed metallic part on the CRT display such as the metal frame, screwheads, control shafts, etc. When the exposed metallic part has a return path to the chassis, the read should be 1.8 megohm minimum

5 LEAKAGE CURRENT HOT CHECK

5-1 Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during this check.

5-2 Connect a 1500 ohm, 10 watt resistor, paralleled with a 0.15mF capacitor between each exposed metallic part and a good ground (as shown in Fig. 1).

5-3 Use an AC voltmeter with a sensitivity of 100 ohm/volt or more and measure the AC voltage across the combination 1500 ohm resistor and 0.15mF capacitor.

5-4 Move the resistor connection to each exposed metallic part and measure the voltage.

5-5 Reverse the polarity of the AC plug in the AC outlet and repeat the above measurement.

5-6 Voltage measured must not exceed 7.5 volt RMS from any exposed metallic part to ground. A leakage current tester may be used in the above hot check, in which case any current measured must not exceed 5.0 milliamp. In the case of a measurement exceeding the 5.0 milliamp value, a rework is required to eliminate the chance of a shock hazard.

Note: High voltage is presented when this CRT display is operating. Always discharge the anode of the picture tube to the display chassis in order to prevent shock hazard..

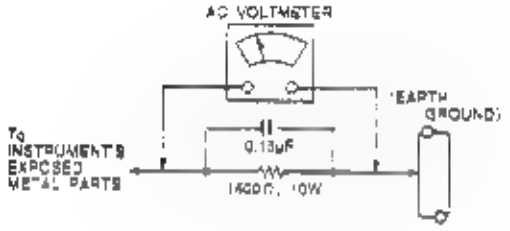


Fig.1

6 IMPLOSION PROTECTION
Picture tubes are equipped with an integral implosion protection system, but care should be taken to avoid damage and scratching during installation. Use only ViewSonic replacement picture tubes.

7 X-RADIATION
WARNING. The only potential source of X-Radiation is the picture tube. However, when the high voltage circuitry is operating properly, there is no possibility of a X-Radiation problem. The basic precaution which must be exercised is to keep the high voltage at the following factory-recommended level.

Note: It is important to use an accurate periodically calibrated high voltage meter.

7-1 The procedure for adjusting high voltage is as shown on page 27.

7-2 If can not be adjusted to 25.0 kv, immediate service is required to prevent the possibility of premature component failure.

7-3 To prevent X-Radiation possibility it is essential to use the specified picture tube.

IMPORTANT SAFETY NOTICE

There are special components used in this CRT displays which are important for safety. These parts are identified by the international symbol ⚠ on the schematic diagram and on the replacement parts list. It is essential that these critical parts be replaced with manufacture's specified parts to prevent S-RADIATION, shock, fire or other hazards. do not modify the original design, as it will void the original parts and labor guarantee.

GENERAL INFORMATION

1. OUTLINE

1769GA-1 is 17 inch color CRT display for Multimedia with the following nice features.
Stereo Dome Speakers with 2 W + 2 W output and Mic function are mounted on monitor, and Headphone is available to use. This monitor also has OSD (on screen display) control and Power saving function based on VESA DPMS.

2. FEATURES

2-1 Stereo Dome Speakers
- High quality stereo sound by ViewSonic Dome Speaker system
- Audio typical output 2 W + 2 W
- THD (Total Harmonic Distortion) maximum 1.0 % (output = 1.0 W)

2-2 Mic function function
A microphone is installed on the front panel of monitor for sending voice message to computer system. Also microphone jack is mounted on left side of monitor for additional use.

2-3 Headphone function
Headphone jack is also mounted on left side of monitor to enjoy music, conversation and entertainment.

2-4 Power Saving
- This monitor is equipped with power management circuitry conforming to the VESA standard.
- Depending on the signal from a computer switching occurs between four modes to minimize non-essential energy consumption.

2-5 OSD (on screen display) function
- OSD (5 languages) is a man-machine interface. **Any one is able to set up the picture desired through OSD menu.**

2-6 Self Test function
- **With a touch of the ([1] button) the self-test function quickly identifies a "no signal condition". This time saving function simplifies diagnostics and prevents unnecessary service calls.**

prevents unnecessary service calls.

2-7 Power Supply with high power factor
- Power Supply with high power factor enables to utilize AC power efficiently meeting EC555-2 (Line Harmonics)

2-8 Ergonomic design
- Low emission design to meet MPR II
- ESF (Electro static field) free coating on CRT

2-9 Multi scan with digital technology
- 8 bit micro computer controls the circuit operation to meet with wide range signal of f_h=30~69 kHz and f_v=50~160 Hz. So VGA640x350, VGA640x400, VGA640x480, SVGA800x600, 1024x768 and 1280x1024 mode are applicable.

2-10 3 Factory presets, (+5 Reservation), 13 user memories.
- 3 standard modes are preset at the factory.
- 5 modes are reserved at the factory.
- 13 user memories are available to set the users own timing and display information.

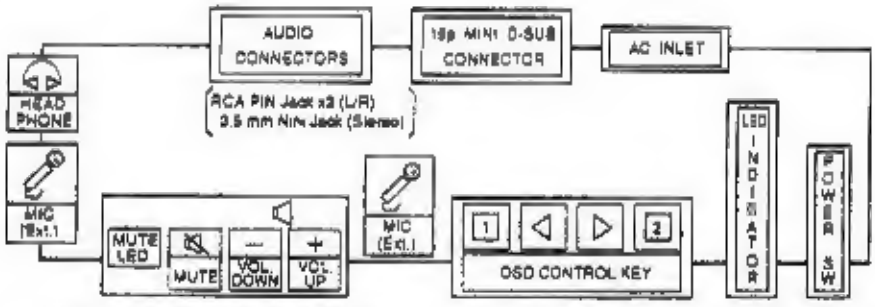
2-11 Flat Face and fine dot pitch
- Flat face CRT with a fine dot pitch of 0.27 mm provides for comfortable viewing.

2-12 Superior display performance
- Good focus by sophisticated gun and dynamic focus circuit
- High contrast CRT (TM=42.5%)
- Minimized distortion by correction circuit
- Good convergence
- Full scan image for graphics

2-13 Plug and Play
- VESA/DDC1 (Display Data Channel) compatible

SPECIFICATION

1. DIAGRAM



1.1 POWER SW, LED, [1]-key, ◁-key, ▷-key, [2]-key, Audio Volume Up/Down Key, Mure-Key and Mure LED are located on the front panel.

1.2 Signal connector and AC inlet are located on the back side of the cabinet.

1.3 OSD menu includes the following function.

CONTRAST	BRIGHTNESS	DEGAUSS
H POSITION	H SIZE	V POSITION
V SIZE	V PIN-CUSHION	TRAPEZOID
PARALLELOGRAM	ROTATION	
COLOR SELECT	DISPLAY FREQUENCY	
VIDEO INPUT LEVEL	LANGUAGES	
RECALL		

※) CONTRAST can be directly controlled with ◁/▷-key.

※) With sync signal, OSD menu appears by pushing [1]-key
Without sync signal, self test menu appears by pushing [1]-key.

※) AUDIO LEVEL can be directly controlled with VOL UP/DOWN-Key.

※) OPTION : H/V Moire reduction.

2. MECHANICAL SPECIFICATIONS

refer to the attached drawing

2.1 Dimension Height: 415 mm (16.5") typ
Width: 438 mm (17.2") typ
Depth: 438 mm (17.2") typ

2.2 Net Weight: 19.5 kg (39.1 lbs) typ

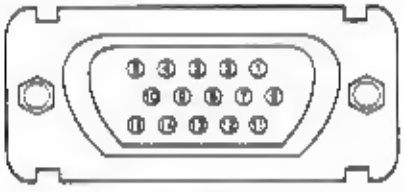
3. CONNECTORS

3.1 Signal connector
Video Signal : 15pin Mini D-Sub
Sync Input : BNC Type pin jack
Mic Output : Ø 3.5 mm Stereo Mini jack**
External Microphone : Ø 3.5 mm Stereo Mini jack
Headphone : Ø 3.5 mm Stereo Mini jack

** To connect with Sound Card. Please use stereo type cable. If you use monoral type cable, Mic doesn't work correctly.

3.2 AC inlet: CEE 22 typed connector

<15P Mini D-Sub Pin assignment>



1 . . RED	6 ... GROUND	11 ... GROUND
2 ... GREEN	7 ... GROUND	12 ... SDA (DDC)
3 . . BLUE	8 ... GROUND	13 ... H. SYNC.
4 ... GROUND	9 ... – (OPEN)	14 ... V. SYNC.
5 . . GROUND (DDC)	10 ... GROUND	15 ... SCL (DDC)

4. CRT SPECIFICATIONS

Part No.	M41KXH140X
Type	17", 90°, 29ø, in-line gun (15.7" Viewable)
Dot Pitch	0.27 mm
Phosphor	R, G, B Short Persistence (Hi-Eu RED)
CIE Color point	Red x: 0.635 (± 0.020) y: 0.333 (± 0.020) Green x: 0.290 (± 0.020) y: 0.595 (± 0.020) Blue x: 0.152 (± 0.015) y: 0.063 (± 0.015)
Bulb	DARK TINT
Face	NEW AGRAS COAT
Total Transmission	42.5 %

5. ELECTRICAL SPECIFICATIONS

5.1 Standard conditions ... Except special items

Display image	Green, full "H" characters with a border line. (7 x 9 dots) Video signal : 100% duty Display area : 300 mm x 225 mm
Video signal level	0.7 Vpp
Contrast, Brightness	Contrast : Max., Brightness : detent point
Ambient Temperature	20±5°C (68 ± 9°F)
Input Voltage	AC 120 V, 60 Hz or AC 220 V 50 Hz
Terrestrial magnetism	Vertical field : northern hemisphere field (40μT) Horizontal field : no field
Viewing direction	Parallel to the CRT axis
Measurements	After an initial warming up time of more than 30 minutes.
Ambient light	200± 50 lX
Display mode	1024 x 768 (60.02 kHz, 75.03 Hz)

5.2 POWER

5.2.1 Power supply : Commercial power source

Input voltage	AC 90 - 132 V	AC 198 - 264 V
Power frequency	50 Hz ±3 Hz	60 Hz±3Hz
Input current	1.5 A Max. (100V)	
Inrush current (at 25° C)	40 A typ	
Power consumption	100 W (Typ.)	

(※1) Input current is reduced to about 60 % our current products by "High Power Factor" techno ogy.

5.2.2 Power Management for Power Saving :

Power saving system is designed based upon VESA DPMS standard (Version : 1.0)

1) Power consumption and recovery time

** APM State	SIGNALS H. Sync	V. Sync	VIDEO	MONITOR POWER CONSUMPTION	RECOVERY TIME TO ON STATE	LED INDICATOR
ON	*3 NORMAL	*3 NORMAL	*2 ACTIVE	*4 100%	——	Green
STAND-BY	No Sync or *5 < 6 kHz	> 40 Hz	BLANK	< 30 W	< 4s	Yellow
SUSPEND	>10 kHz	No Sync or *5 < 30 Hz	BLANK	< 30 W	< 4s	Yellow
OFF	No Sync or *5 < 6 kHz	No Sync or *5 < 30 Hz	BLANK	< 8 W	< 20s	Yellow

** The transition time from ON state to each APM state is 5 seconds minimum.

*1: APM: Advanced Power Management.

*2: Means condition of power consumption for ON state.
DISPLAY IMAGE: WHITE full "H" characters with a border line (7 X 9 dots).

*3: NORMAL: See *7.4 ACCEPTABLE TIMING

*4: Power Consumption is measured at AC 100-240V.

*5: Power saving operation is done at or less than specified value in the list.

5.3 Standard timing (Standard mode)

- The following total 3 modes (5 modes) are preset (reserved) in the memory as standard timing at the factory.
- Fig-1 shows a definition of timing and signal level.
- Electrical performance is specified. This SPECIFICATION is specified at STD (1024 x 768) mode unless otherwise mentioned. (MODE-2)

TIMING CHART

A	Period
B	Blanking
C	Sync Width
D	Back Porch
E	Active
F	Front Potch

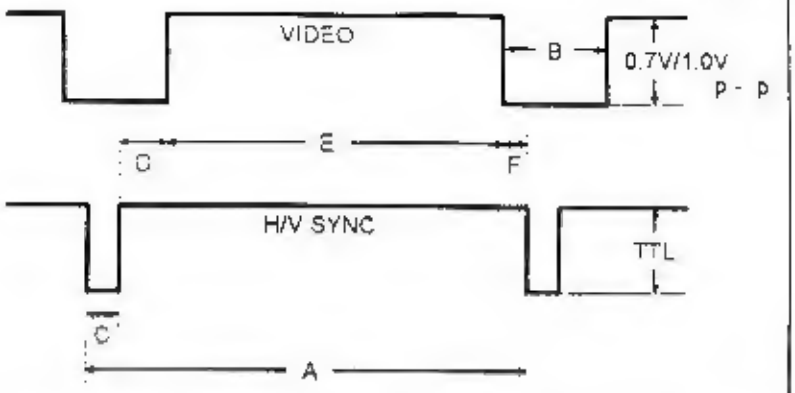


Fig.2

FOR PRESET

		MODE - 1	MODE - 2	MODE - 3
		640 × 480 (60)	1024 × 768 (75)	1280 × 1024 (60)
DOT CLOCK		25.1745 MHz	78.7500 MHz	109.4695 MHz
H	f H	31.4661 KHz	60.0229 KHz	63.7192 KHz
	A - PERIOD	31.778 µs (800 dots)	16.660 µs (1,312 dots)	15.694 µs (1,718 dots)
	B - BLANKING TIME	6.366 µs (160 dots)	3.657 µs (288 dots)	4.001 µs (438 dots)
	C - SYNC WIDTH	3.813 µs (96 dots)	1.219 µs (96 dots)	1.425 µs (156 dots)
	D - BACK PORCH	1.907 µs (48 dots)	2.235 µs (176 dots)	2.174 µs (238 dots)
	E - ACTIVE TIME	25.423 µs (640 dots)	13.003 µs (1,024 dots)	11.693 µs (1,280 dots)
	F - FRONT PORCH	0.636 µs (16 dots)	0.203 µs (16 dots)	0.402 µs (44 dots)
V	f V	59.9393 Hz	75.0286 Hz	59.9992 Hz
	A - PERIOD	16.684 ms (525 lines)	13.328 ms (800 lines)	16.667 ms (1,062 lines)
	B - BLANKING TIME	1.430 ms (45 lines)	0.533 ms (32 lines)	0.596 ms (38 lines)
	C - SYNC WIDTH	0.064 ms (2 lines)	0.050 ms (3 lines)	0.047 ms (3 lines)
	D - BACK PORCH	1.049 ms (33 lines)	0.466 ms (28 lines)	0.502 ms (32 lines)
	E - ACTIVE TIME	15.254 ms (480 lines)	12.795 ms (768 lines)	16.071 ms (1,024 lines)
	F - FRONT PORCH	0.318 ms (10 lines)	0.017 ms (1 lines)	0.047 ms (3 lines)
SYNC POLARITY(H/V)		Negative / Negative	Positive / Positive	Sync on green

FOR RESERVATION

		MODE - 4	MODE - 5	MODE - 6
		640 × 480 (75)	800 × 600 (75)	MAC-II (832 × 624)
DOT CLOCK		31.5000 MHz	49.5000 MHz	57.2830 MHz
H	f H	37.5000 KHz	46.8750 KHz	49.7248 KHz
	A - PERIOD	26.667 µs (840 dots)	21.333 µs (1,056 dots)	20.111 µs (1,152 dots)
	B - BLANKING TIME	6.349 µs (200 dots)	5.172 µs (256 dots)	5.586 µs (320 dots)
	C - SYNC WIDTH	2.032 µs (64 dots)	1.616 µs (80 dots)	1.117 µs (64 dots)
	D - BACK PORCH	3.810 µs (120 dots)	3.232 µs (160 dots)	3.910 µs (224 dots)
	E - ACTIVE TIME	20.317 µs (640 dots)	16.162 µs (800 dots)	14.524 µs (832 dots)
	F - FRONT PORCH	0.508 µs (16 dots)	0.323 µs (16 dots)	0.559 µs (32 dots)
V	f V	75.0000 Hz	75.0000 Hz	74.5500 Hz
	A - PERIOD	13.333 ms (500 lines)	13.333 ms (625 lines)	13.414 ms (667 lines)
	B - BLANKING TIME	0.533 ms (20 lines)	0.533 ms (25 lines)	0.865 ms (43 lines)
	C - SYNC WIDTH	0.080 ms (3 lines)	0.064 ms (3 lines)	0.060 ms (3 lines)
	D - BACK PORCH	0.427 ms (16 lines)	0.448 ms (21 lines)	0.784 ms (39 lines)
	E - ACTIVE TIME	12.800 ms (480 lines)	12.800 ms (600 lines)	12.549 ms (624 lines)
	F - FRONT PORCH	0.027 ms (1 lines)	0.021 ms (1 lines)	0.020 ms (1 lines)
SYNC POLARITY(H/V)		Negative / Negative	Positive / Positive	Negative / Negative

FOR RESERVATION

		MODE - 7	MODE - 8
		1024 × 768 (70)	1024 × 768 (72)
	DOT CLOCK	75.0000 MHz	75.0000 MHz
H	f H	56.4759 KHz	57.8704 KHz
H	A - PERIOD	17.707 µs (1,328 dots)	17.280 µs (1,296 dots)
H	B - BLANKING TIME	4.053 µs (304 dots)	3.627 µs (272 dots)
H	C - SYNC WIDTH	1.813 µs (136 dots)	1.920 µs (144 dots)
H	D - BACK PORCH	1.920 µs (144 dots)	1.387 µs (104 dots)
H	E - ACTIVE TIME	13.653 µs (1,024 dots)	13.653 µs (1,024 dots)
H	F - FRONT PORCH	0.320 µs (24 dots)	0.320 µs (24 dots)
V	f V	70.0694 Hz	71.7995 Hz
V	A - PERIOD	14.272 ms (806 lines)	13.928 ms (806 lines)
V	B - BLANKING TIME	0.673 ms (38 lines)	0.657 ms (38 lines)
V	C - SYNC WIDTH	0.106 ms (6 lines)	0.104 ms (6 lines)
V	D - BACK PORCH	0.513 ms (29 lines)	0.501 ms (29 lines)
V	E - ACTIVE TIME	13.599 ms (768 lines)	13.271 ms (768 lines)
V	F - FRONT PORCH	0.053 ms (3 lines)	0.052 ms (3 lines)
	SYNC POLARITY(H/V)	Negative / Negative	Negative / Negative

FOR ADJUSTMENT

		- 1	- 2	- 3
	DOT CLOCK	22.6000 MHz	40.2480 MHz	64.0400 MHz
H	f H	29.5039 KHz	39.0000 KHz	53.9966 KHz
H	A - PERIOD	33.894 µs (766 dots)	25.641 µs (1,032 dots)	18.520 µs (1,186 dots)
H	B - BLANKING TIME	8.496 µs (192 dots)	3.926 µs (158 dots)	4.497 µs (288 dots)
H	C - SYNC WIDTH	4.115 µs (93 dots)	1.491 µs (60 dots)	1.718 µs (110 dots)
H	D - BACK PORCH	2.788 µs (63 dots)	2.336 µs (94 dots)	2.186 µs (140 dots)
H	E - ACTIVE TIME	25.395 µs (574 dots)	21.715 µs (874 dots)	14.022 µs (898 dots)
H	F - FRONT PORCH	1.593 µs ([illegible] dots)	0.099 µs (4 dots)	0.593 µs (38 dots)
V	f V	48.0520 Hz	77.0751 Hz	105.0518 Hz
V	A - PERIOD	20.811 ms (614 lines)	12.974 ms (506 lines)	9.519 ms (514 lines)
V	B - BLANKING TIME	0.915 ms (27 lines)	0.744 ms ([illegible] lines)	0.482 ms (26 lines)
V	C - SYNC WIDTH	0.102 ms (3 lines)	0.103 ms (4 lines)	0.037 ms (2 lines)
V	D - BACK PORCH	0.712 ms (21 lines)	0.513 ms (20 lines)	0.352 ms (19 lines)
V	E - ACTIVE TIME	19.896 ms (587 lines)	12.231 ms (477 lines)	9.035 ms (488 lines)
V	F - FRONT PORCH	0.102 ms (3 lines)	0.128 ms (5 lines)	0.093 ms (5 lines)
	SYNC POLARITY(H/V)	Negative / Negative	Negative / Negative	Negative / Negative

FOR ADJUSTMENT

		- 4
	DOT CLOCK	93.4300 MHz
H	f H	69.9850 KHz
H	A - PERIOD	14.289 µs (1,335 dots)
H	B - BLANKING TIME	3.329 µs (311 dots)
H	C - SYNC WIDTH	1.092 µs (102 dots)
H	D - BACK PORCH	1.820 µs (170 dots)
H	E - ACTIVE TIME	10.960 µs (1,024 dots)
H	F - FRONT PORCH	0.417 µs (39 dots)
V	f V	165.0590 Hz
V	A - PERIOD	6.058 ms (424 lines)
V	B - BLANKING TIME	0.457 ms (32 lines)
V	C - SYNC WIDTH	0.043 ms (3 lines)
V	D - BACK PORCH	0.343 ms (24 lines)
V	E - ACTIVE TIME	5.601 ms (392 lines)
V	F - FRONT PORCH	0.071 ms (5 lines)
	SYNC POLARITY(H/V)	Negative / Negative